STIC Search Report
EIC 1700

STIC Database Tracking Number: 164940

TO: Peter Szekely
Location: REM 10D29
Art Unit : 1714
September 26, 2005

Case Serial Number: 10/678471

From: Usha Shrestha
Location: EIC 1700
REMSEN 4B28
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Search Notes

sira
Search and Information
Resources Administration

STIC Search Results Feedback Form

EIC17000

Questions about the scope or the results of the search? Contact ***the EIC searcher or contact***:

Kathleen Fuller, EIC 1700 Team Leader
571/272-2505 REMSEN 4B28

Voluntary Results Feedback Form

- *I am an examiner in Workgroup:* ☐ *Example: 1713*
- *Relevant prior art* ***found****, search results used as follows:*
  - ☐ 102 rejection
  - ☐ 103 rejection
  - ☐ Cited as being of interest.
  - ☐ Helped examiner better understand the invention.
  - ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature
  (journal articles, conference proceedings, new product announcements etc.)

- *Relevant prior art* ***not found:***
  - ☐ Results verified the lack of relevant prior art (helped determine patentability).
  - ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to EIC1700 REMSEN 4B28

Access DB# 164940

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Peter A Szekely Examiner # : 69764 Date: 9/6/05
Art Unit: 1714 Phone Number 272-1124 Serial Number: 10/678 471
Mail Box and Bldg/Room Location: Remsen 10D29 Results Format Preferred (circle): [✓ PAPER] DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Flame retardant thermoset composition, method and article

Inventors (please provide full names): John Campbell, Bryan Duffey, John Rude, Prameela Susarla, Michael Vallance, Gary Yeager, Kenneth Zarnoch

Earliest Priority Filing Date: 10/03/03

**For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

See enclosed claims.

SCIENTIFIC REFERENCE BR
Sci & Tech Inf. Cntr
SEP RECD
Pat. & T.M. Office

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STAFF USE ONLY	**Type of Search**	**Vendors and cost where applicable**
Searcher:	NA Sequence (#)	STN $560.74
Searcher Phone #:	AA Sequence (#)	Dialog
Searcher Location:	Structure (#) 2	Questel/Orbit
Date Searcher Picked Up:	Bibliographic	Dr.Link
Date Completed: 9/26/05	Litigation	Lexis/Nexis
Searcher Prep & Review Time: 120	Fulltext	Sequence Systems
Clerical Prep Time: 30	Patent Family	WWW/Internet
Online Time: 150	Other	Other (specify)

PTO-1590 (8-01)

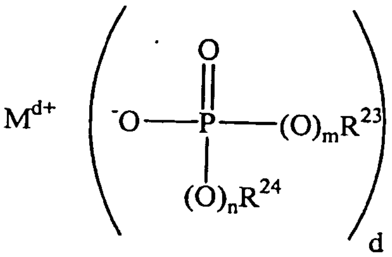
CLAIMS:

1. A curable composition, comprising:

a functionalized poly(arylene ether) resin;

an acryloyl monomer; and

a metallophosphorus flame retardant having the formula



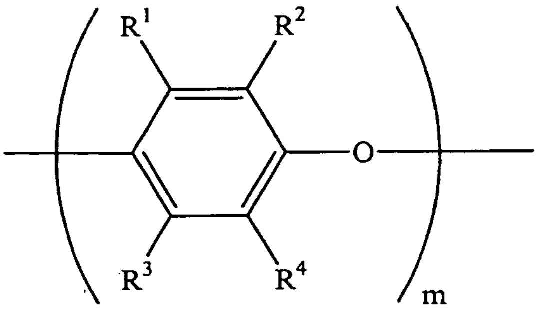
$$M^{d+}\left({}^{-}O-\overset{\overset{\displaystyle O}{\|}}{\underset{\underset{\displaystyle (O)_nR^{24}}{|}}{P}}-(O)_mR^{23}\right)_d$$

wherein M is Mg, Ca, Al, Sb, Sn, Ge, Ti, Zn, Fe, Zr, Ce, Bi, Sr, Mn, Li, Na, or K; d is 1, 2, 3, or 4 according to the identity of M and its oxidation state; each occurrence of R^{23} and R^{24} is independently C_1-C_{18} hydrocarbyl; and each occurrence of m and n is 0 or 1.

2. The composition of claim 1, wherein the functionalized poly(arylene ether) resin is a capped poly(arylene ether) resin having the formula

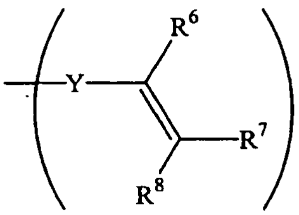
$$Q(J\text{-}K)_y$$

wherein Q is the residuum of a monohydric, dihydric, or polyhydric phenol; y is 1 to 100; J comprises repeating structural units having the formula

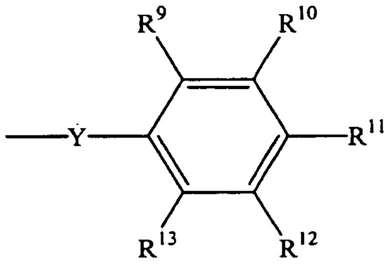


wherein R^1 and R^3 are each independently selected from the group consisting of hydrogen, halogen, primary or secondary C_1-C_{12} alkyl, C_2-C_{12} alkenyl, C_2-C_{12} alkynyl, C_1-C_{12} aminoalkyl, C_1-C_{12} hydroxyalkyl, phenyl, C_1-C_{12} haloalkyl, C_1-C_{12} hydrocarbyloxy, and C_2-C_{12} halohydrocarbyloxy wherein at least two carbon atoms separate the halogen and oxygen atoms; R^2 and R^4 are each independently selected from the group consisting of halogen, primary or secondary C_1-C_{12} alkyl, C_2-C_{12} alkenyl, C_2-C_{12} alkynyl, C_1-C_{12} aminoalkyl, C_1-C_{12} hydroxyalkyl, phenyl, C_1-C_{12} haloalkyl, C_1-C_{12} hydrocarbyloxy, and C_2-C_{12} halohydrocarbyloxy wherein at least two carbon atoms separate the halogen and oxygen atoms; m is 1 to about 200; and K is a capping group selected from the group consisting of

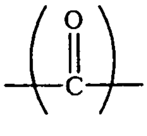
$-Y-R^5$,



, and

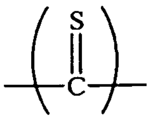


wherein R^5 is C_1-C_{12} alkyl; R^6-R^8 are each independently selected from the group consisting of hydrogen, C_1-C_{18} hydrocarbyl, C_2-C_{18} hydrocarbyloxycarbonyl, nitrile, formyl, carboxylate, imidate, and thiocarboxylate; R^9-R^{13} are each independently selected from the group consisting of hydrogen, halogen, C_1-C_{12} alkyl, hydroxy, and amino; and wherein Y is a divalent group selected from the group consisting of



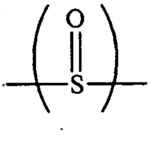
$$-\left(\overset{\displaystyle O}{\overset{\|}{C}}\right)-$$

,



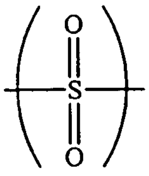
$$-\left(\overset{\displaystyle S}{\overset{\|}{C}}\right)-$$

,



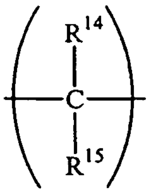
$$-\left(\overset{\displaystyle O}{\overset{\|}{S}}\right)-$$

,



$$-\left(\underset{\displaystyle O}{\underset{\|}{\overset{\displaystyle O}{\overset{\|}{S}}}}\right)-$$

, and

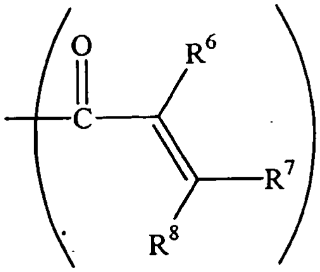


$$-\left(\underset{\displaystyle R^{15}}{\underset{|}{\overset{\displaystyle R^{14}}{\overset{|}{C}}}}\right)-$$

wherein R^{14} and R^{15} are each independently selected from the group consisting of hydrogen and C_1-C_{12} alkyl.

3. The curable composition of claim 2, wherein Q is the residuum of a monohydric phenol.

4. The curable composition of claim 1, wherein the capped poly(arylene ether) comprises at least one capping group having the structure

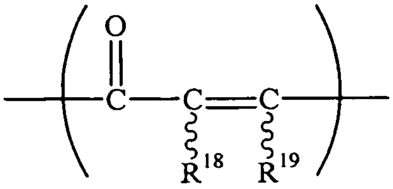


wherein R^6-R^8 are each independently selected from the group consisting of hydrogen, C_1-C_{18} hydrocarbyl, C_2-C_{12} hydrocarbyloxycarbonyl, nitrile, formyl, carboxylate, imidate, and thiocarboxylate.

5. The curable composition of claim 4, wherein R^6 is hydrogen or methyl, and R^7 and R^8 are hydrogen.

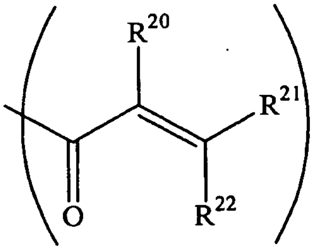
6. The curable composition of claim 1, comprising about 5 to about 90 parts by weight of the functionalized poly(arylene ether) per 100 parts by weight total of the functionalized poly(arylene ether) and the acryloyl monomer.

7. The composition of claim 1, wherein the acryloyl monomer comprises at least one acryloyl moiety having the structure



wherein R^{18} and R^{19} are each independently selected from the group consisting of hydrogen and C_1-C_{12} alkyl, and wherein R^{18} and R^{19} may be disposed either cis or trans about the carbon-carbon double bond.

8. The composition of claim 1, wherein the acryloyl monomer comprises at least one acryloyl moiety having the structure



wherein R^{20}-R^{22} are each independently selected from the group consisting of hydrogen, C_1-C_{12} hydrocarbyl, C_2-C_{18} hydrocarbyloxycarbonyl, nitrile, formyl, carboxylate, imidate, and thiocarboxylate.

9. The composition of claim 8, wherein the acryloyl monomer comprises at least two acryloyl moieties.

10. The composition of claim 8, wherein the acryloyl monomer comprises at least three acryloyl moieties.

11. The composition of claim 1, wherein the acryloyl monomer comprises trimethylolpropane tri(meth)acrylate, 1,6-hexanediol di(meth)acrylate, neopentyl glycol di(meth)acrylate, ethylene glycol di(meth)acrylate, propylene glycol di(meth)acrylate, cyclohexanedimethanol di(meth)acrylate, butanediol di(meth)acrylate, diethylene glycol di(meth)acrylate, triethylene glycol di(meth)acrylate, isobornyl (meth)acrylate, methyl (meth)acrylate, methacryloxypropyl trimethoxysilane, ethoxylated (2) bisphenol A di(meth)acrylate, or a mixture of at least two of the foregoing acryloyl monomers.

12. The composition of claim 1, comprising about 10 to about 95 parts acryloyl monomer per 100 parts by weight total of the functionalized poly(arylene ether) and the acryloyl monomer.

13. The composition of claim 1, wherein each occurrence of R^{23} and R^{24} is independently C_1-C_6 alkyl.

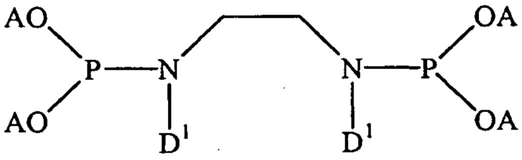
14. The composition of claim 1, wherein each occurrence of R^{23} and R^{24} is methyl or ethyl.

15. The composition of claim 1, wherein M is aluminum and each occurrence of m and n is zero.

16. The composition of claim 1, wherein the metallophosphorus flame retardant is aluminum tris(diethylphosphinate).

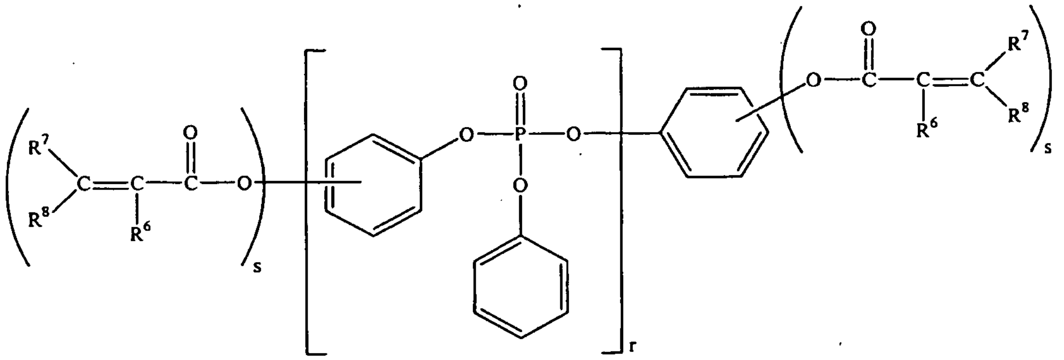
17. The composition of claim 1, comprising about 0.1 to about 50 parts by weight of the metallophosphorus flame retardant per 100 parts by weight total of the functionalized poly(arylene ether) and the acryloyl monomer.

18. The composition of claim 1, further comprising an aromatic bisphosphoramidate flame retardant of the formula



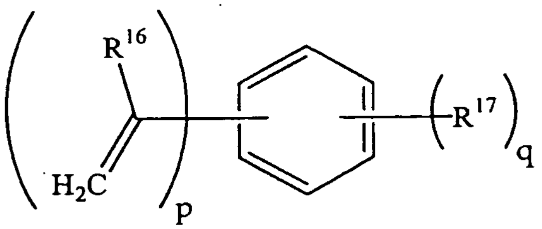
wherein A is a monocyclic aromatic radical and D^1 is a C_{1-4} primary or secondary alkyl radical or both D^1 radicals taken together are ethylene.

19. The composition of claim 1, further comprising an aromatic polyphosphate flame retardant having the formula



wherein each occurrence of R^6-R^8 is independently selected from the group consisting of hydrogen, C_1-C_{18} hydrocarbyl, C_2-C_{12} hydrocarbyloxycarbonyl, nitrile, formyl, carboxylate, imidate, and thiocarboxylate; r is 2 to about 20; and each occurrence of s is 0, 1, or 2, with the proviso that at least one occurrence of s is 1.

20. The composition of claim 1, further comprising an alkenyl aromatic compound having the formula



wherein each occurrence of R^{16} is independently hydrogen or C_1-C_{18} hydrocarbyl; each occurrence of R^{17} is independently halogen, C_1-C_{12} alkyl, C_1-C_{12} alkoxyl, or C_6-C_{18} aryl; p is 1 to 4; and q is 0 to 5.

21. The curable composition of claim 20, wherein the alkenyl aromatic monomer is selected from styrene, α-methylstyrene, 2-methylstyrene, 3-methylstyrene, 4-methylstyrene, 2-t-butylstyrene, 3-t-butylstyrene, 4-t-butylstyrene, 1,3-divinylbenzene, 1,4-divinylbenzene, 1,3-diisopropenylbenzene, 1,4-diisopropenylbenzene, styrenes having from 1 to 5 halogen substituents on the aromatic ring, and combinations thereof.

22. The composition of claim 20, comprising about 10 to about 500 parts by weight alkenyl aromatic monomer per 100 parts by weight total of the functionalized poly(arylene ether) and the acryloyl monomer.

23. The composition of claim 1, further comprising an allylic monomer.

24. The composition of claim 23, wherein the allylic monomer is selected from diallyl phthalate, diallyl isophthalate, triallyl mellitate, triallyl mesate, triallyl benzenes, triallyl cyanurate, triallyl isocyanurate, and mixtures thereof.

25. The composition of claim 23, comprising about 10 to about 500 parts by weight allylic monomer per 100 parts by weight total of the functionalized poly(arylene ether) and the acryloyl monomer.

26. The curable composition of claim 1, further comprising about 5 to about 95 weight percent of a particulate filler, based on the total weight of the composition.

27. The curable composition of claim 26, wherein the particulate filler is fused silica.

28. The curable composition of claim 26, wherein the particulate filler comprises a first fused silica having an average particle size of about 0.03 micrometer to less than 1 micrometer, and a second fused silica having an average particle size greater than 1 micrometer to about 30 micrometers.

29. The curable composition of claim 1, further comprising a curing catalyst.

30. The curable composition of claim 29, wherein the curing catalyst is selected from benzoyl peroxide, dicumyl peroxide, methyl ethyl ketone peroxide, lauryl peroxide, cyclohexanone peroxide, t-butyl hydroperoxide, t-butyl benzene hydroperoxide, t-butyl peroctoate, 2,5-dimethylhexane-2,5-dihydroperoxide, 2,5-dimethyl-2,5-di(t-butylperoxy)-hex-3-yne, di-t-butylperoxide, t-butylcumyl peroxide, α,α'-bis(t-butylperoxy-m-isopropyl)benzene, 2,5-dimethyl-2,5-di(t-butylperoxy)hexane, di(t-butylperoxy) isophthalate, t-butylperoxybenzoate, 2,2-bis(t-butylperoxy)butane, 2,2-bis(t-butylperoxy)octane, 2,5-dimethyl-2,5-di(benzoylperoxy)hexane, di(trimethylsilyl)peroxide, trimethylsilylphenyltriphenylsilyl peroxide, and mixtures thereof.

31. The curable composition of claim 1, further comprising a curing inhibitor.

32. The curable composition of claim 31, wherein the curing inhibitor is selected from diazoaminobenzene, phenylacetylene, sym-trinitrobenzene, p-benzoquinone, acetaldehyde, aniline condensates, N,N'-dibutyl-o-phenylenediamine, N-butyl-p-aminophenol, 2,4,6-triphenylphenoxyl, pyrogallol, catechol, hydroquinone, C_1-C_6-alkyl-substituted catechols, dialkylhydroquinone, 2,4,6-dichloronitrophenol, halogen-ortho-nitrophenols, alkoxyhydroquinone, mono- and di- and polysulfides of phenols and catechols, thiols and oximes and hydrazones of quinone, phenothiazine, dialkylhydroxylamines, and combinations thereof.

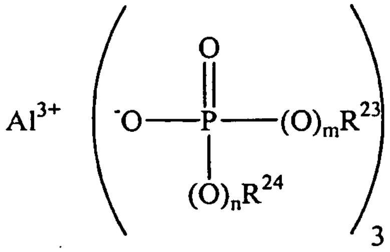
33. The curable composition of claim 1, further comprising an additive selected from dyes, pigments, colorants, antioxidants, heat stabilizers, light stabilizers, plasticizers, lubricants, flow modifiers, drip retardants, flame retardants, antiblocking agents, antistatic agents, flow-promoting agents, processing aids, substrate adhesion agents, mold release agents, toughening agents, low-profile additives, stress-relief additives, and combinations thereof.

34. A curable composition, comprising:

a (meth)acrylate-capped poly(2,6-dimethyl-1,4-phenylene ether) resin, a (meth)acrylate-capped poly(2,6-dimethyl-1,4-phenylene ether-*co*-2,3,6-trimethyl-1,4-phenylene ether) resin, or a mixture thereof;

an acryloyl monomer selected from trimethylolpropane tri(meth)acrylate, hexanediol di(meth)acrylate, cyclohexanedimethanol di(meth)acrylate, methacryloxypropyl trimethoxysilane, ethoxylated (2) bisphenol A dimethacrylate, or a mixture thereof;

an aluminophosphorus flame retardant having the formula



$$\mathrm{Al}^{3+}\left(\begin{array}{c} \mathrm{O} \\ \| \\ {}^{-}\mathrm{O}-\mathrm{P}-(\mathrm{O})_m\mathrm{R}^{23} \\ | \\ (\mathrm{O})_n\mathrm{R}^{24} \end{array}\right)_3$$

wherein each occurrence of R^{23} and R^{24} is independently C_1-C_6 alkyl, and each occurrence of m and n is 0; and

fused silica.

35. The curable composition of claim 34, further comprising a curing catalyst.

36. A cured composition, comprising the reaction product obtained by curing the curable composition of claim 34.

37. A curable composition, comprising:

about 5 to about 40 parts by weight of a (meth)acrylate-capped poly(2,6-dimethyl-1,4-phenylene ether) resin, a (meth)acrylate-capped poly(2,6-dimethyl-1,4-phenylene ether-*co*-2,3,6-trimethyl-1,4-phenylene ether) resin, or a mixture thereof;

about 60 to about 95 parts by weight of an acryloyl monomer selected from trimethylolpropane tri(meth)acrylate, hexanediol di(meth)acrylate, cyclohexanedimethanol di(meth)acrylate, methacryloxypropyl trimethoxysilane, ethoxylated (2) bisphenol A di(meth)acrylate, or a mixture thereof;

about 1 to about 50 parts by weight of aluminum tris(diethylphosphinate); and

about 100 to about 2,000 parts by weight of fused silica;

wherein all parts by weight are based on 100 parts by weight total for the (meth)acrylate-capped poly(arylene ether) resin and the acryloyl monomer.

38. The curable composition of claim 37, further comprising a curing catalyst.

39. A cured composition, comprising the reaction product obtained by curing the curable composition of claim 37.

40. A cured composition, comprising the reaction product obtained by curing the curable composition of claim 1.

41. The cured composition of claim 40, having a UL94 rating of V-0 or V-1.

42. The cured composition of claim 40, having a glass transition temperature of at least 120°C.

43. The cured composition of claim 40, wherein the composition dried for 24 hours at 115°C exhibits a weight difference less than ±0.05% after exposure to 168 hours at 85°C and 85% relative humidity and redrying for 24 hours at 115°C.

44. An article comprising the cured composition of claim 36.

45. An article comprising the cured composition of claim 39.

46. An article comprising the cured composition of claim 40.

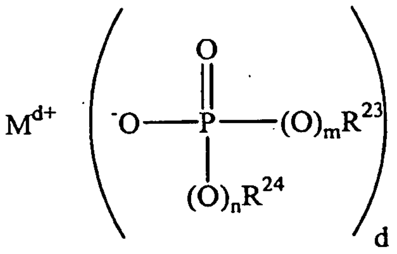
47. A method of preparing a curable composition, comprising:

blending

a functionalized poly(arylene ether) resin;

an acryloyl monomer; and

a metallophosphorus flame retardant having the formula



$$M^{d+}\left({}^{-}O-\underset{(O)_nR^{24}}{\underset{|}{\overset{\overset{O}{\|}}{P}}}-(O)_mR^{23}\right)_d$$

wherein M is Mg, Ca, Al, Sb, Sn, Ge, Ti, Zn, Fe, Zr, Ce, Bi, Sr, Mn, Li, Na, or K; d is 1, 2, 3, or 4 according to the identity of M and its oxidation state; each occurrence of R^{23} and R^{24} is independently C_1-C_{18} hydrocarbyl; and each occurrence of m and n is 0 or 1

to form an intimate blend.

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=> fil reg
FILE 'REGISTRY' ENTERED AT 11:44:27 ON 26 SEP 2005

=> d his ful

     FILE 'LREGISTRY' ENTERED AT 10:04:07 ON 26 SEP 2005
L1                STR
L2                STR
L3                STR L1

     FILE 'REGISTRY' ENTERED AT 10:06:22 ON 26 SEP 2005
L4                SCR 2043
L5             50 SEA SSS SAM L2 AND L3 AND L4
L6          69521 SEA ABB=ON  PLU=ON  (P(L)O(L)C(L)M)/ELS(L)4-5/ELC.SUB
                  D QUE STAT L5

     FILE 'REGISTRY' ENTERED AT 10:26:32 ON 26 SEP 2005
L7                STR L2
L8             50 SEA SSS SAM L7 AND L3 AND L4
L9          52864 SEA SSS FUL L3 AND L7 AND L4

     FILE 'HCAPLUS' ENTERED AT 10:30:30 ON 26 SEP 2005
L10             2 SEA ABB=ON  PLU=ON  US20050075426/PN
                  SEL RN

     FILE 'REGISTRY' ENTERED AT 10:30:59 ON 26 SEP 2005
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                  OR 225789-38-8/BI OR 2530-85-0/BI OR 3290-92-4/BI OR
                  129186-62-5/BI OR 129284-26-0/BI OR 218768-84-4/BI OR
                  24938-67-8/BI OR 25134-01-4/BI OR 565450-05-7/BI OR
                  848942-84-7/BI OR 848942-85-8/BI)
L12             4 SEA ABB=ON  PLU=ON  L11 AND L9
                  D SCAN
                  SAV L9 TEMP SZE471/A
L13            32 SEA ABB=ON  PLU=ON  L9 AND L6

     FILE 'HCAPLUS' ENTERED AT 10:33:58 ON 26 SEP 2005
L14         40134 SEA ABB=ON  PLU=ON  L6
L15         31608 SEA ABB=ON  PLU=ON  L9
L16            99 SEA ABB=ON  PLU=ON  L14 AND L15
                  D FHITSTR
L17             1 SEA ABB=ON  PLU=ON  L16 AND L10
L18            16 SEA ABB=ON  PLU=ON  L16 AND POF/RL

     FILE 'REGISTRY' ENTERED AT 10:44:23 ON 26 SEP 2005
L19             1 SEA ABB=ON  PLU=ON  225789-38-8/RN
                  D SCAN


     FILE 'HCAPLUS' ENTERED AT 10:45:13 ON 26 SEP 2005
L20            41 SEA ABB=ON  PLU=ON  L19
L21             1 SEA ABB=ON  PLU=ON  L20 AND L15
L22             5 SEA ABB=ON  PLU=ON  L16 AND (FIRE(A)PROOF? OR FIREPROOF
                  ? OR FLAME(A)RETARDANT? OR FLAMERETARDANT?)
                  D SCAN HIT
L23            17 SEA ABB=ON  PLU=ON  L18 OR L22
L24            21 SEA ABB=ON  PLU=ON  L13
L25             1 SEA ABB=ON  PLU=ON  L24 AND (FIRE(A)PROOF? OR FIREPROOF
                  ? OR FLAME(A)RETARDANT? OR FLAMERETARDANT?)
                  D L24 HITSTR
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                D HIT
                D HITSTR
L26          17 SEA ABB=ON  PLU=ON  L21 OR L23 OR L25
L27          54 SEA ABB=ON  PLU=ON  L16 AND PREP/RL
L28           8 SEA ABB=ON  PLU=ON  L27 AND ?PHOSPHIN?
                D HIT
L29          28 SEA ABB=ON  PLU=ON  L28 OR L24
L30         526 SEA ABB=ON  PLU=ON  L15 AND ?PHOSPHIN?
L31          29 SEA ABB=ON  PLU=ON  L30 AND (FIRE(A)PROOF? OR FIREPROOF
                ? OR FLAME(A)RETARDANT? OR FLAMERETARDANT?)
                D FHITSTR
L32          31 SEA ABB=ON  PLU=ON  L22 OR L25 OR L31
L33           3 SEA ABB=ON  PLU=ON  L28 AND (FIRE(A)PROOF? OR FIREPROOF
                ? OR FLAME(A)RETARDANT? OR FLAMERETARDANT?)
L34          31 SEA ABB=ON  PLU=ON  L32 OR L33
                D HIT



=> d que l34
L3              STR
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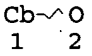

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RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS   2

STEREO ATTRIBUTES: NONE
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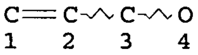

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NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
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RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS   4

STEREO ATTRIBUTES: NONE
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L13          32 SEA FILE=REGISTRY ABB=ON  PLU=ON  L9 AND L6
L14       40134 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L6
L15       31608 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L9
L16          99 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L14 AND L15
L22           5 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L16 AND (FIRE(A)PROOF?
                 OR FIREPROOF? OR FLAME(A)RETARDANT? OR FLAMERETARDANT?
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L24            21 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13
L25             1 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L24 AND (FIRE(A)PROOF?
                  OR FIREPROOF? OR FLAME(A)RETARDANT? OR FLAMERETARDANT?
                )
L27            54 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L16 AND PREP/RL
L28             8 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L27 AND ?PHOSPHIN?
L30           526 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L15 AND ?PHOSPHIN?
L31            29 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L30 AND (FIRE(A)PROOF?
                  OR FIREPROOF? OR FLAME(A)RETARDANT? OR FLAMERETARDANT?
                )
L32            31 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L22 OR L25 OR L31
L33             3 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L28 AND (FIRE(A)PROOF?
                  OR FIREPROOF? OR FLAME(A)RETARDANT? OR FLAMERETARDANT?
                )
L34            31 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L32 OR L33


=> fil hcap
FILE 'HCAPLUS' ENTERED AT 11:44:55 ON 26 SEP 2005


=> d l34 1-31 ibib abs hitstr hitind

L34  ANSWER 1 OF 31  HCAPLUS  COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER:         2005:539707  HCAPLUS
DOCUMENT NUMBER:          143:60400
TITLE:                    Use of hydroxyl-groups containing
                          phosphinates as flame
                          retardant and in the preparation of
                          flame retardants that can be
                          used to be built into polymer resins, the
                          phosphinates containing organic groups
                          that can be polymerized prepared in this way
                          as well as the flame
                          retardant polymer resins
INVENTOR(S):              Bauer, Monika
PATENT ASSIGNEE(S):       Fraunhofer-Gesellschaft zur Foerderung der
                          Angewandten Forschung e.V., Germany
SOURCE:                   Eur. Pat. Appl., 31 pp.
                          CODEN: EPXXDW
DOCUMENT TYPE:            Patent
LANGUAGE:                 German
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

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                                                                   2004
                                                                   1214
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             EE, HU, PL, SK, BA, HR, IS, YU
     DE 10359269          A1    20050714    DE 2003-10359269
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PRIORITY APPLN. INFO.:                      DE 2003-10359269    A
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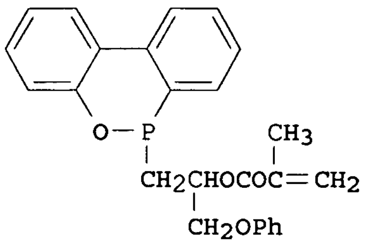
2003
1217

GI



I

AB Hydroxyl-containing **phosphinates** having polymerizable double bonds are integrated into polymer chain by esterifying OH-groups or by reacting OH-groups with polyisocyanates resulting in polyurethane groups to give fire-resistant polymer resins. Thus, I, (prepared by reacting Ph glycidyl ether with DOPO in the presence of triethanolamine as a catalyst at 140° and reacting the resulting alc. with methacrylic acid chloride in CHCl3 at -5°) is copolymd. with Ebecryl 600 (using 150 kGy irradiation for crosslinking) to give a copolymer having glass transition temperature 73.5° and exhibiting a good self-extinguishing time in a horizontal flammability test (UL-94 HB).

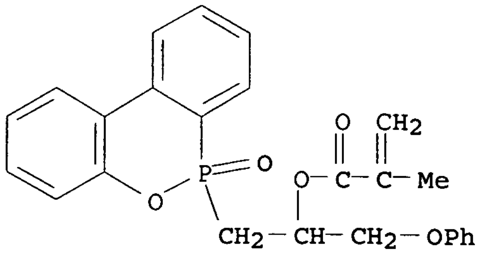
IT **854499-90-4P 854499-95-9P 854499-97-1P**
854499-99-3P 854500-01-9P 854500-03-1P
(copolymer; hydroxyl-containing **phosphinates** having polymerizable double bonds (comonomers) integrated into polymer chain by esterifying OH-groups or by reacting OH-groups with polyisocyanates)

RN 854499-90-4 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 1-[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-2-phenoxyethyl ester, polymer with (1-methylethylidene)bis[4,1-phenyleneoxy(2-hydroxy-3,1-propanediyl)] di-2-propenoate (9CI) (CA INDEX NAME)

CM 1

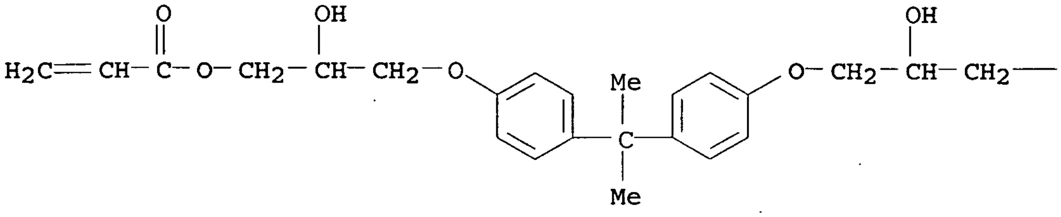
CRN 854499-80-2
CMF C25 H23 O5 P



CM 2

CRN 4687-94-9
CMF C27 H32 O8

PAGE 1-A



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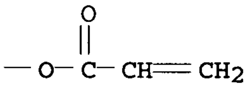
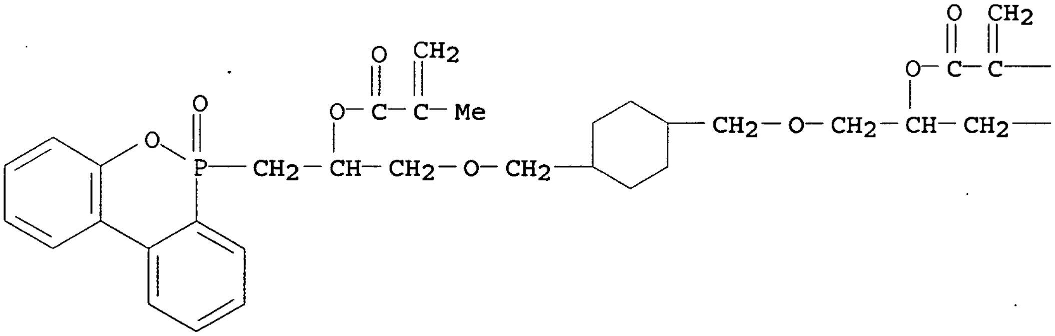


RN 854499-95-9 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, 1,4-cyclohexanediylbis[methyleneoxy[1-[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-2,1-ethanediyl]] ester, polymer with (1-methylethylidene)bis[4,1-phenyleneoxy(2-hydroxy-3,1-propanediyl)] di-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 854499-93-7
CMF C46 H50 O10 P2

PAGE 1-A



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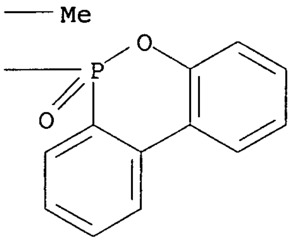
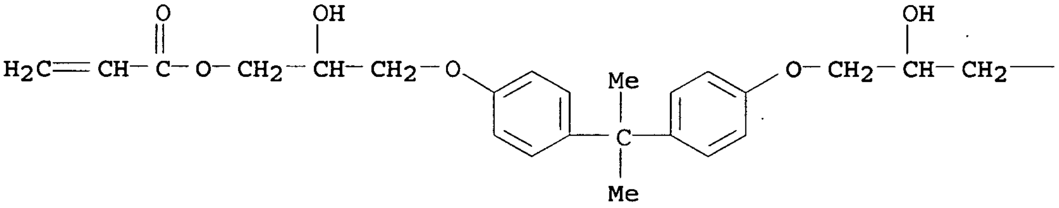


CM 2

CRN 4687-94-9
CMF C27 H32 O8

PAGE 1-A



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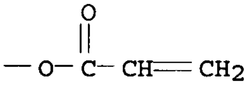
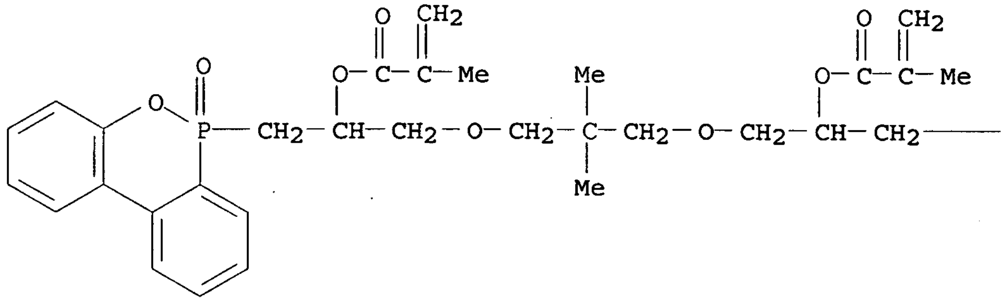


RN 854499-97-1 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, 2,2-dimethyl-1,3-propanediylbis[oxy[1-[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-2,1-ethanediyl]] ester, polymer with (1-methylethylidene)bis[4,1-phenyleneoxy(2-hydroxy-3,1-propanediyl)] di-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 854499-87-9
CMF C43 H46 O10 P2

PAGE 1-A



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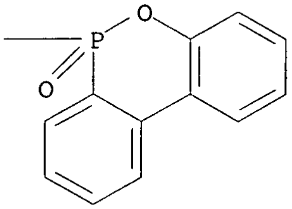
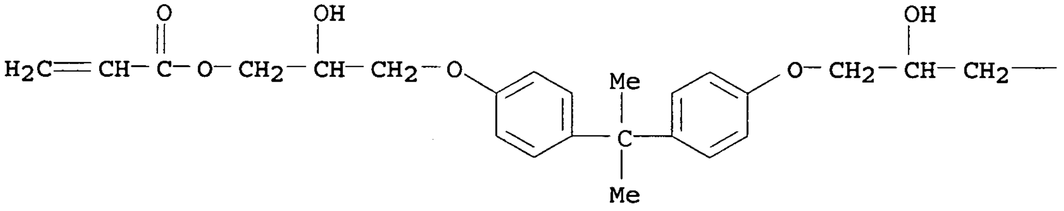


CM 2

CRN 4687-94-9
CMF C27 H32 O8

PAGE 1-A



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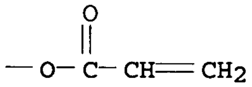

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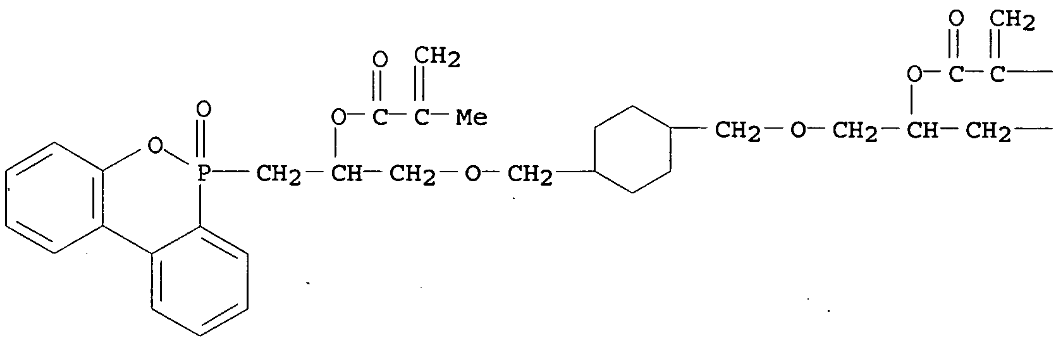
RN 854499-99-3 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, 1,4-cyclohexanediylbis[methyleneoxy[1-[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-2,1-ethanediyl]] ester, polymer with (1-methylethylidene)bis[4,1-

phenyleneoxy(2-hydroxy-3,1-propanediyl)] bis(2-methyl-2-propenoate) (9CI) (CA INDEX NAME)

CM 1

CRN 854499-93-7
CMF C46 H50 O10 P2

PAGE 1-A



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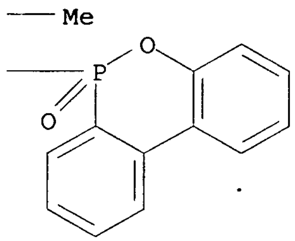
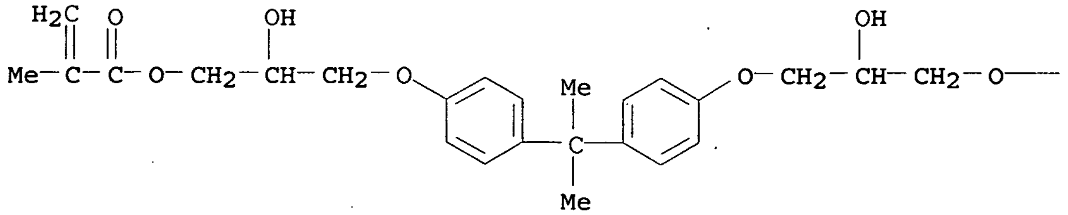


CM 2

CRN 1565-94-2
CMF C29 H36 O8

PAGE 1-A



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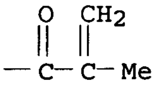


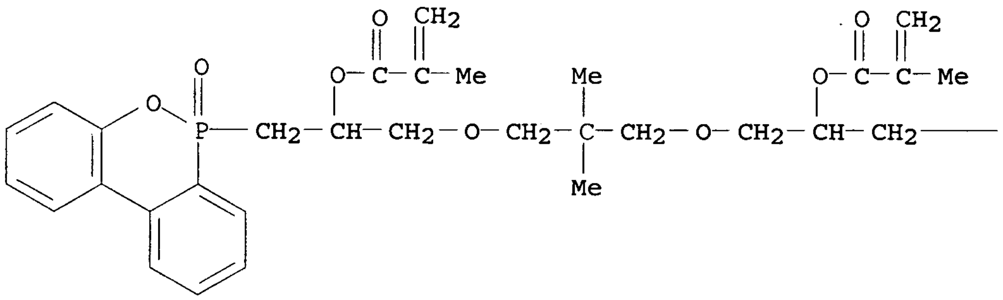
$-\overset{O}{\overset{\|}{C}}-\overset{CH_2}{\overset{\|}{C}}-Me$

RN 854500-01-9 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, 2,2-dimethyl-1,3-propanediylbis[oxy[1-[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-2,1-ethanediyl]] ester, polymer with (1-methylethylidene)bis[4,1-phenyleneoxy(2-hydroxy-3,1-propanediyl)] bis(2-methyl-2-propenoate) (9CI) (CA INDEX NAME)

CM 1

CRN 854499-87-9
CMF C_{43} H_{46} O_{10} P_2

PAGE 1-A



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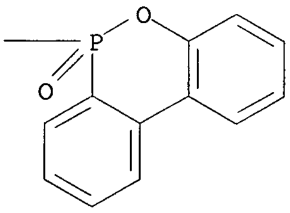
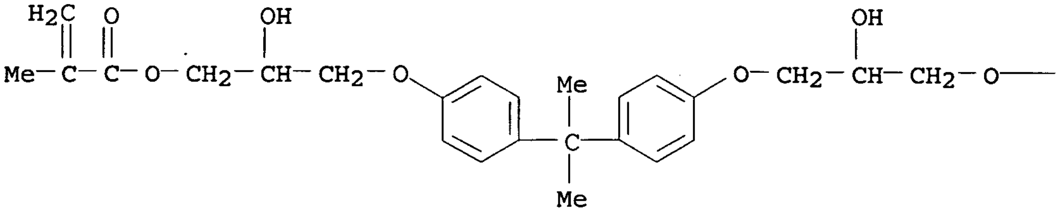


CM 2

CRN 1565-94-2
CMF C_{29} H_{36} O_8

PAGE 1-A



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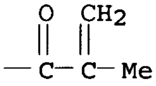
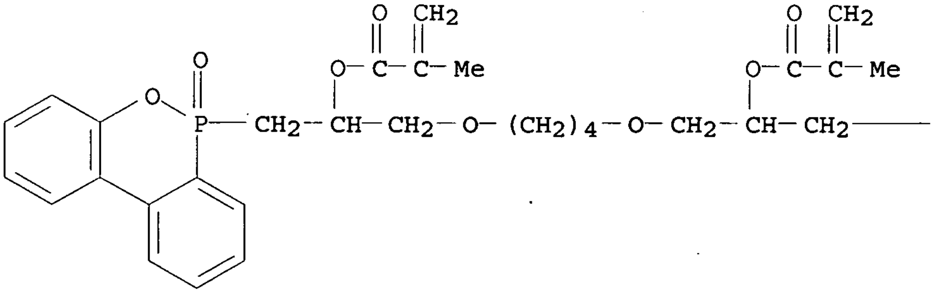


RN 854500-03-1 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, 1,4-butanediylbis[oxy[1-[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-2,1-ethanediyl]] ester, polymer with (1-methylethylidene)bis[4,1-phenyleneoxy(2-hydroxy-3,1-propanediyl)] bis(2-methyl-2-propenoate) (9CI) (CA INDEX NAME)

CM 1

CRN 854499-78-8
CMF C42 H44 O10 P2

PAGE 1-A



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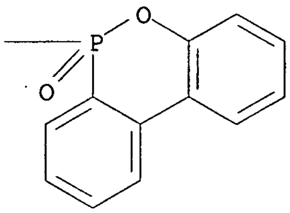
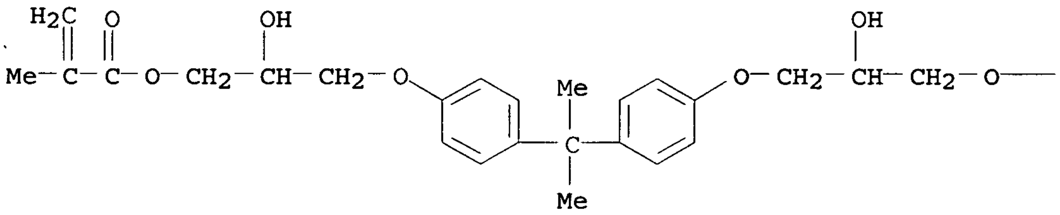


CM 2

CRN 1565-94-2
CMF C29 H36 O8

PAGE 1-A



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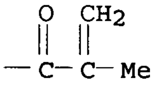

$-C(=O)-C(=CH_2)-Me$

IC ICM C08G018-38
ICS C08F008-40; C08K005-5313
CC 35-4 (Chemistry of Synthetic High Polymers)
ST hydroxyl contg **phosphinate** polymerizable double bond **flame retardant** compn
IT Fire-resistant materials
(hydroxyl-containing **phosphinates** having polymerizable double bonds (comonomers) integrated into polymer chain by esterifying OH-groups or by reacting OH-groups with polyisocyanates)
IT Polyurethanes, preparation
(hydroxyl-containing **phosphinates** having polymerizable double bonds (comonomers) integrated into polymer chain by esterifying OH-groups or by reacting OH-groups with polyisocyanates)
IT 31305-91-6, Glycerol-triglycidyl ether homopolymer
(Polypox R 12, comonomer precursor; hydroxyl-containing **phosphinates** having polymerizable double bonds (comonomers) integrated into polymer chain by esterifying

OH-groups or by reacting OH-groups with polyisocyanates)

IT 171564-01-5, Pentaerythritol tetraglycidyl ether homopolymer
(Polypox R 16, comonomer precursor; hydroxyl-containing **phosphinates** having polymerizable double bonds (comonomers) integrated into polymer chain by esterifying OH-groups or by reacting OH-groups with polyisocyanates)

IT 42765-17-3, Trimethylolpropane triglycidyl ether homopolymer
(Polypox R 20, comonomer precursor; hydroxyl-containing **phosphinates** having polymerizable double bonds (comonomers) integrated into polymer chain by esterifying OH-groups or by reacting OH-groups with polyisocyanates)

IT 854499-78-8P
(comonomer precursor; hydroxyl-containing **phosphinates** having polymerizable double bonds (comonomers) integrated into polymer chain by esterifying OH-groups or by reacting OH-groups with polyisocyanates)

IT 35948-26-6P 37632-26-1P 854499-70-0P 854499-72-2P
854499-74-4P
(comonomer precursor; hydroxyl-containing **phosphinates** having polymerizable double bonds (comonomers) integrated into polymer chain by esterifying OH-groups or by reacting OH-groups with polyisocyanates)

IT 67-64-1, Acetone, reactions 106-91-2, -Glycidyl methacrylate 122-60-1, Phenyl glycidyl ether 920-46-7, Methacrylic acid chloride 1675-54-3, Bisphenol A diglycidyl ether 3126-63-4, Pentaerythritol tetraglycidyl ether 3454-29-3, Trimethylolpropane triglycidyl ether 6303-21-5D, **Phosphinic** acid, esters 24801-88-5, [3-(Triethoxysilyl(]propylisocyanate 28768-32-3 29611-97-0, Polypox R3 30525-89-4, Paraformaldehyde 35948-25-5, DOPO 54847-49-3, Polypox R 14 146246-76-6, Polypox R 11
(comonomer precursor; hydroxyl-containing **phosphinates** having polymerizable double bonds (comonomers) integrated into polymer chain by esterifying OH-groups or by reacting OH-groups with polyisocyanates)

IT 854499-87-9P
(comonomer; hydroxyl-containing **phosphinates** having polymerizable double bonds (comonomers) integrated into polymer chain by esterifying OH-groups or by reacting OH-groups with polyisocyanates)

IT 167307-28-0P 854499-80-2P 854499-82-4P 854499-85-7P
854499-93-7P
(comonomer; hydroxyl-containing **phosphinates** having polymerizable double bonds (comonomers) integrated into polymer chain by esterifying OH-groups or by reacting OH-groups with polyisocyanates)

IT 854499-88-0P **854499-90-4P 854499-95-9P**
854499-97-1P 854499-99-3P 854500-01-9P
854500-03-1P
(copolymer; hydroxyl-containing **phosphinates** having polymerizable double bonds (comonomers) integrated into polymer chain by esterifying OH-groups or by reacting OH-groups with polyisocyanates)

IT 102-71-6, Triethanolamine, uses
(hydroxyl-containing **phosphinates** having polymerizable double bonds (comonomers) integrated into polymer chain by esterifying OH-groups or by reacting OH-groups with polyisocyanates)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE

IN THE RE FORMAT

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L34  ANSWER 2 OF 31  HCAPLUS  COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER:         2005:303414  HCAPLUS
DOCUMENT NUMBER:          142:356116
TITLE:                    Flame-retardant thermoset
                          composition, method, and article
INVENTOR(S):              Campbell, John Robert; Duffey, Bryan; Rude,
                          John Austin; Susarla, Prameela; Vallance,
                          Michael Alan; Yeager, Gary William; Zarnoch,
                          Kenneth Paul
PATENT ASSIGNEE(S):       General Electric Company, USA
SOURCE:                   U.S. Pat. Appl. Publ., 17 pp., Cont.-in-part
                          of U.S. Ser. No. 678,471.
                          CODEN: USXXCO
DOCUMENT TYPE:            Patent
LANGUAGE:                 English
FAMILY ACC. NUM. COUNT:   2
PATENT INFORMATION:

     PATENT NO.           KIND   DATE         APPLICATION NO.        DATE
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     US 2005075426         A1    20050407     US 2003-678471
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     WO 2005033179         A1    20050414     WO 2004-US31826
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         W:  AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ,
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             ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP,
             KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
             MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL,
             PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR,
             TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
        RW:  BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
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             MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI,
             CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG
PRIORITY APPLN. INFO.:                        US 2003-678471      A2
                                                                     2003
                                                                     1003

                                              US 2004-947265      A
                                                                     2004
                                                                     0923

OTHER SOURCE(S):          MARPAT 142:356116
AB   A curable composition includes a functionalized poly(arylene ether)
     resin, an acryloyl monomer, and a metallo(or onium)phosphorus
     flame retardant.  The composition exhibits an
     improved balance of properties such as toughness, flame
     retardance, heat-resistance, and moisture resistance.  It is
     useful as an encapsulant for semiconductor products.  An example
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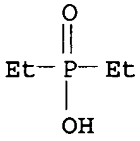
molding composition contained fused silica 83.0, methacrylate-capped PPE 4.25, dicumyl peroxide 0.32, C black 0.20, 4-tert-Bu catechol 0.04, hexanediol diacrylate 7.89, TMPTMA 2.20, MAPTMS 0.50, and Al tris(**diethylphosphinate**) 1.60 parts.

IT **225789-38-8**, Aluminum **diethylphosphinate**
(Exolit OP 930; **flame-retardant** nitrogen phosphate or Al **diethylphosphinate**-containing polyoxyphenylene composition for molding)
RN 225789-38-8 HCAPLUS
CN Phosphinic acid, diethyl-, aluminum salt (9CI) (CA INDEX NAME)



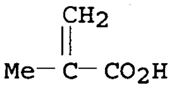
$\mathrm{Et{-}\overset{\displaystyle O}{\overset{\|}{\underset{\underset{\displaystyle OH}{|}}{P}}}{-}Et}$

● 1/3 Al

IT **129186-62-5**
(assumed monomers; **flame-retardant** nitrogen phosphate or Al **diethylphosphinate**-containing polyoxyphenylene composition for molding)
RN 129186-62-5 HCAPLUS
CN Phenol, 2,6-dimethyl-, homopolymer, mono(2-methyl-2-propenoate) (9CI) (CA INDEX NAME)

CM 1

CRN 79-41-4
CMF C4 H6 O2



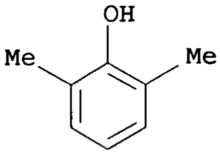
$\mathrm{Me{-}\overset{\displaystyle CH_2}{\overset{\|}{C}}{-}CO_2H}$

CM 2

CRN 25134-01-4
CMF (C8 H10 O)x
CCI PMS

CM 3

CRN 576-26-1
CMF C8 H10 O



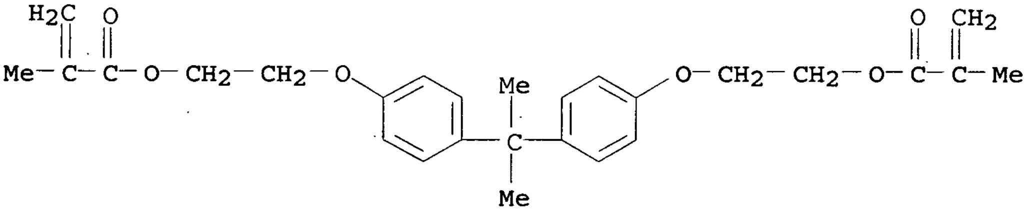
IT **848942-84-7P**, Poly(2,6-dimethyl-1,4-phenylene ether) monomethacrylate-SR 348 copolymer **848942-85-8P**
(**flame-retardant** nitrogen phosphate or Al **diethylphosphinate**-containing polyoxyphenylene composition for molding)

RN 848942-84-7 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, (1-methylethylidene)bis(4,1-phenyleneoxy-2,1-ethanediyl) ester, polymer with 2,6-dimethylphenol homopolymer mono(2-methyl-2-propenoate) (9CI) (CA INDEX NAME)

CM 1

CRN 24448-20-2
CMF C27 H32 O6

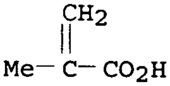


CM 2

CRN 129186-62-5
CMF (C8 H10 O)x . C4 H6 O2

CM 3

CRN 79-41-4
CMF C4 H6 O2



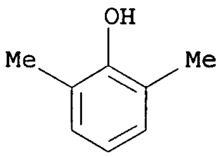
$$\overset{CH_2}{\underset{}{Me-\overset{\|}{C}-CO_2H}}$$

CM 4

CRN 25134-01-4
CMF (C8 H10 O)x
CCI PMS

CM 5

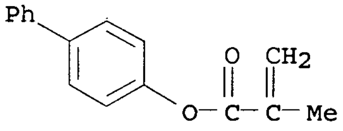
CRN 576-26-1
CMF C8 H10 O



RN 848942-85-8 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, (1-methylethylidene)bis(4,1-phenyleneoxy-2,1-ethanediyl) ester, polymer with [1,1'-biphenyl]-4,4'-diyl bis(2-methyl-2-propenoate), [1,1'-biphenyl]-4-yl 2-methyl-2-propenoate and 2,6-dimethylphenol homopolymer mono(2-methyl-2-propenoate) (9CI) (CA INDEX NAME)

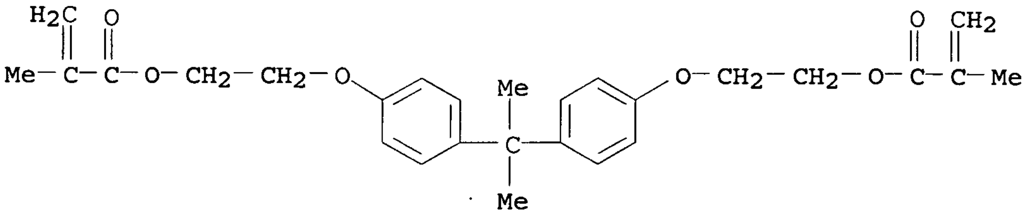
CM 1

CRN 46904-74-9
CMF C16 H14 O2



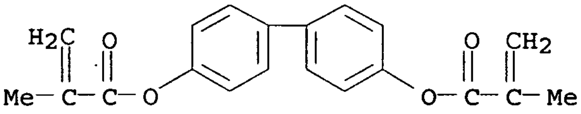
CM 2

CRN 24448-20-2
CMF C27 H32 O6



CM 3

CRN 13082-48-9
CMF C20 H18 O4

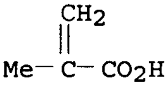


CM 4

CRN 129186-62-5
CMF (C8 H10 O)x . C4 H6 O2

CM 5

CRN 79-41-4
CMF C4 H6 O2

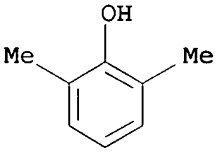


CM 6

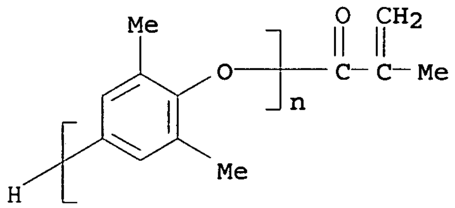
CRN 25134-01-4
CMF (C8 H10 O)x
CCI PMS

CM 7

CRN 576-26-1
CMF C8 H10 O



IT **129284-26-0**
(**flame-retardant** nitrogen phosphate or Al **diethylphosphinate**-containing polyoxyphenylene composition for molding)
RN 129284-26-0 HCAPLUS
CN Poly[oxy(2,6-dimethyl-1,4-phenylene)], α-(2-methyl-1-oxo-2-propenyl)-ω-hydro- (9CI) (CA INDEX NAME)



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IC   ICM  C08K005-49
INCL 524115000
CC   37-6 (Plastics Manufacture and Processing)
ST   fireproofing phosphorus agent polyphenylene ether
     thermoset semiconductor encapsulant
IT   Fireproofing agents
        (flame-retardant nitrogen phosphate or Al
        diethylphosphinate-containing polyoxyphenylene composition for
        molding)
IT   Polyoxyphenylenes
        (flame-retardant nitrogen phosphate or Al
        diethylphosphinate-containing polyoxyphenylene composition for
        molding)
IT   Molded plastics, properties
        (flame-retardant nitrogen phosphate or Al
        diethylphosphinate-containing polyoxyphenylene composition for
        molding)
IT   124452-51-3, Cyclohexanedimethanol diacrylate
        (CD 406; flame-retardant nitrogen phosphate
        or Al diethylphosphinate-containing polyoxyphenylene
        composition for molding)
IT   225789-38-8, Aluminum diethylphosphinate
        (Exolit OP 930; flame-retardant nitrogen
        phosphate or Al diethylphosphinate-containing
        polyoxyphenylene composition for molding)
IT   129186-62-5
        (assumed monomers; flame-retardant nitrogen
        phosphate or Al diethylphosphinate-containing
        polyoxyphenylene composition for molding)
IT   848942-84-7P, Poly(2,6-dimethyl-1,4-phenylene ether)
     monomethacrylate-SR 348 copolymer 848942-85-8P
        (flame-retardant nitrogen phosphate or Al
        diethylphosphinate-containing polyoxyphenylene composition for
        molding)
IT   218768-84-4, Melapur 200   565450-05-7, Exolit OP 1311
        (flame-retardant nitrogen phosphate or Al
        diethylphosphinate-containing polyoxyphenylene composition for
        molding)
IT   3290-92-4, SR 350 129284-26-0
        (flame-retardant nitrogen phosphate or Al
        diethylphosphinate-containing polyoxyphenylene composition for
        molding)
IT   2530-85-0, Z 6030   13048-33-4, SR 238
        (flame-retardant nitrogen phosphate or Al
        diethylphosphinate-containing polyoxyphenylene composition for
        molding)

L34  ANSWER 3 OF 31  HCAPLUS  COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER:        2005:260136  HCAPLUS
DOCUMENT NUMBER:         142:317964
```

TITLE: Reactive **flame retardant** for **flame-retardant** molded articles without bleeding out
INVENTOR(S): Shigehara, Kiyotaka; Kanno, Toshiyuki; Onitsuka, Asuka; Yanase, Hironori; Nomura, Tomohiro
PATENT ASSIGNEE(S): Fuji Electric Holdings Co., Ltd., Japan; Toho Chemical Industry Co., Ltd.
SOURCE: PCT Int. Appl., 61 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

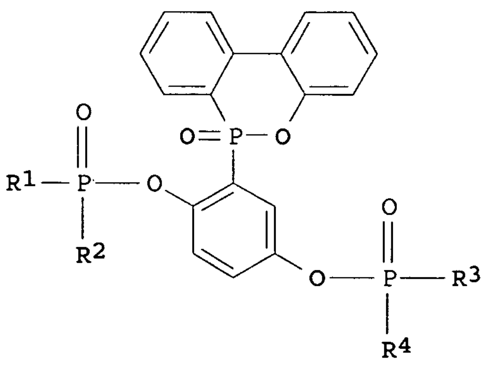
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005026251	A1	20050324	WO 2004-JP3191	2004 0311

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.: JP 2003-317632 A 2003 0910
JP 2003-317633 A 2003 0910

OTHER SOURCE(S): MARPAT 142:317964
GI



I

AB The reactive **flame retardant** is an organophosphorus cyclic compound I having ≥1 unsatd. group at ends of R1 to R4, wherein R1, R2, R3, R4 = NHCH2CH:CH2, N(CH2CH:CH2)2, OCH2CH:CH2, CH2CH:CH2, CH2CH2OCH:CH2, C6H4CH:CH2, OC6H4CH:CH2, CH2C6H6CH:CH2, NHC6H4CH:CH2, N(CH2CH:CH2)C6H4CH:CH2, OROOCC(R'):CH2, NHRNHCOC(R'):CH2, or C≤12 aryl; R = C2-5 alkylene; and R' = H or Me. Thus, 91.99 g phosphoryl chloride and 32.43 g 10-(2,5-dihydroxyphenyl)-9-oxo-10-phospho-9,10-dihydrophenanthren-10-one were reacted at room temperature in the presence of triethylamine for 12 h, 58.30 g diallylamine was added therein and reacted to give a reactive phosphorus compound, 12 parts of which was mixed with 2123B (nylon 66) 57.3, 03.JAFT2Ak25 (glass fiber) 25, carbon black 0.5, Irganox 1010 0.2, and talc 5 parts, kneaded at 280°, pelletized, and injection-molded to give a molded article, which was irradiated with a γ-ray, showing flame retardancy (UL 94) V-0, no bleeding out, and good dimensional stability.

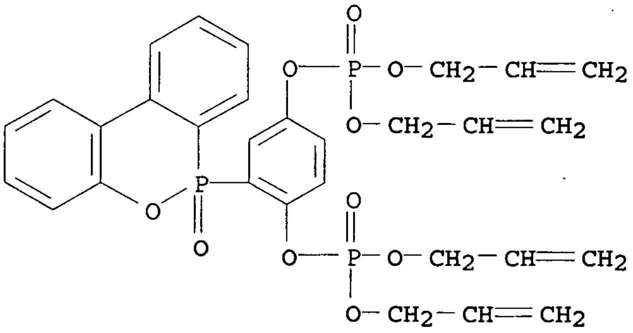
IT **848035-76-7P 848035-78-9P 848035-81-4P**
848035-83-6P
(**flame retardant**; preparation of reactive **flame retardants** for **flame-retardant** molded articles without bleeding out)

RN 848035-76-7 HCAPLUS

CN Phosphoric acid, 2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-1,4-phenylene tetra-2-propenyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 848035-40-5
CMF C30 H31 O10 P3

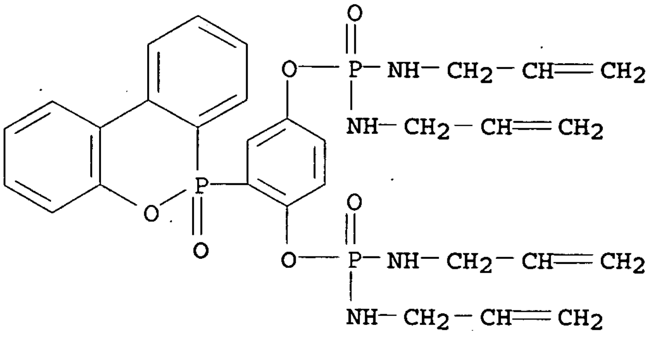


RN 848035-78-9 HCAPLUS

CN 2-Propenoic acid, (2,4,6-trioxo-1,3,5-triazine-1,3,5(2H,4H,6H)-triyl)tri-2,1-ethanediyl ester, polymer with 2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-1,4-phenylene bis[N,N'-di-2-propenylphosphorodiamidate] (9CI) (CA INDEX NAME)

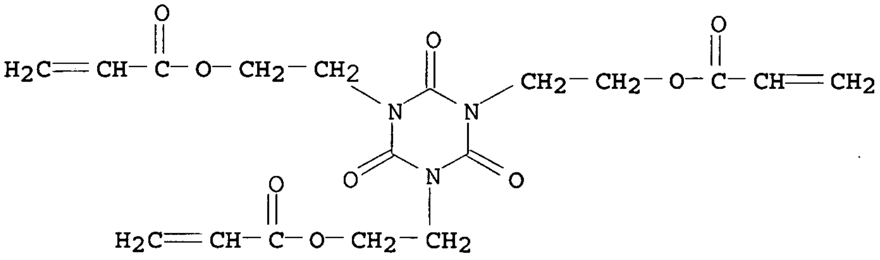
CM 1

CRN 848035-39-2
CMF C30 H35 N4 O6 P3



CM 2

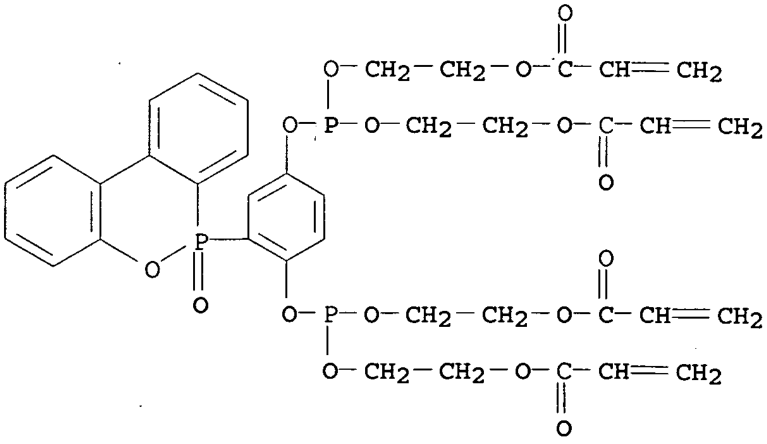
CRN 40220-08-4
CMF C18 H21 N3 O9



RN 848035-81-4 HCAPLUS
CN 2-Propenoic acid, [2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-1,4-phenylene]bis[oxyphosphinidynebis(oxy-2,1-ethanediyl)] ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

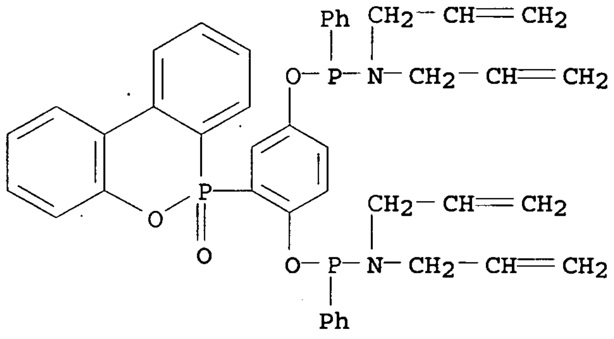
CRN 848035-70-1
CMF C38 H39 O16 P3



RN 848035-83-6 HCAPLUS
CN 2-Propenoic acid, (2,4,6-trioxo-1,3,5-triazine-1,3,5(2H,4H,6H)-triyl)tri-2,1-ethanediyl ester, polymer with 2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-1,4-phenylene bis(P-phenyl-N,N-di-2-propenylphosphonamidite) (9CI) (CA INDEX NAME)

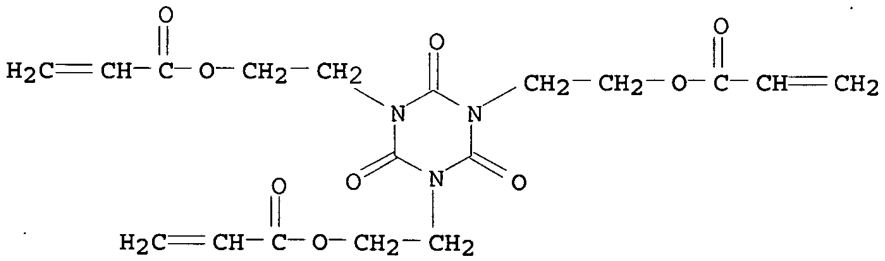
CM 1

CRN 848035-59-6
CMF C42 H41 N2 O4 P3



CM 2

CRN 40220-08-4
CMF C18 H21 N3 O9



IC ICM C08K005-5313
ICS C09K021-12
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 42, 45, 76
ST reactive **flame retardant** molded article bleeding out; phosphoryl chloride dihydroxyphenyloxophosphodihydro phenanthrenone diallylamine reactant; nylon reactive **flame retardant** homopolymer compn molded article
IT Phosphates, uses
(cyclic; preparation of reactive **flame retardants** for **flame-retardant** molded articles without bleeding out)
IT Coating materials
(fire-resistant; preparation of reactive **flame**

```
        retardants for flame-retardant
        molded articles without bleeding out)
IT   Electric apparatus
     Electronic packaging materials
     Fire-resistant materials
       Fireproofing agents
        (preparation of reactive flame retardants for
        flame-retardant molded articles without
        bleeding out)
IT   Epoxy resins, uses
     Polyamides, uses
     Polyesters, uses
        (preparation of reactive flame retardants for
        flame-retardant molded articles without
        bleeding out)
IT   Molded plastics, uses
        (preparation of reactive flame retardants for
        flame-retardant molded articles without
        bleeding out)
IT   26062-94-2
        (assumed monomers; preparation of reactive flame
        retardants for flame-retardant
        molded articles without bleeding out)
IT   848035-74-5P   848035-75-6P 848035-76-7P   848035-77-8P
     848035-78-9P   848035-79-0P   848035-80-3P
     848035-81-4P   848035-82-5P 848035-83-6P
     848035-84-7P
        (flame retardant; preparation of reactive
        flame retardants for flame-
        retardant molded articles without bleeding out)
IT   848035-38-1P   848035-39-2P   848035-40-5P   848035-41-6P
     848035-42-7P   848035-43-8P   848035-44-9P   848035-45-0P
     848035-46-1P   848035-47-2P   848035-48-3P   848035-49-4P
     848035-50-7P   848035-51-8P   848035-52-9P   848035-53-0P
     848035-54-1P   848035-55-2P   848035-56-3P   848035-57-4P
     848035-58-5P   848035-59-6P   848035-60-9P   848035-61-0P
     848035-62-1P   848035-63-2P   848035-64-3P   848035-65-4P
     848035-66-5P   848035-67-6P   848035-68-7P   848035-69-8P
     848035-70-1P   848035-71-2P   848035-72-3P   848035-73-4P
        (monomeric flame retardant; preparation of
        reactive flame retardants for flame
        -retardant molded articles without bleeding out)
IT   768379-04-0P
        (preparation of reactive flame retardants for
        flame-retardant molded articles without
        bleeding out)
IT   24968-12-5, Toraycon 1401X06   24993-04-2, 2123B   32131-17-2,
     2020B, uses   224778-54-5, Semikoto 115
        (preparation of reactive flame retardants for
        flame-retardant molded articles without
        bleeding out)
IT   106-95-6, Allyl bromide, reactions   107-11-9, Allylamine
     107-18-6, Allyl alcohol, reactions   110-75-8, 2-Chloroethylvinyl
     ether   124-02-7, Diallylamine   644-97-3,
     Dichlorophenylphosphine   818-61-1, 2-Hydroxyethylacrylate
     824-72-6   1520-21-4, p-Aminostyrene   1592-20-7,
     p-Chloromethylstyrene   2039-82-9, p-Bromostyrene   2628-17-3,
     p-Hydroxystyrene   7719-12-2, Phosphorous trichloride
     10025-87-3, Phosphoryl chloride   36043-00-2   38613-89-7
     63298-57-7   77918-51-5   91270-74-5   99208-50-1   232258-82-1
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```
         (preparation of reactive flame retardants for
         flame-retardant molded articles without
         bleeding out)
REFERENCE COUNT:         6     THERE ARE 6 CITED REFERENCES AVAILABLE
                               FOR THIS RECORD. ALL CITATIONS AVAILABLE
                               IN THE RE FORMAT

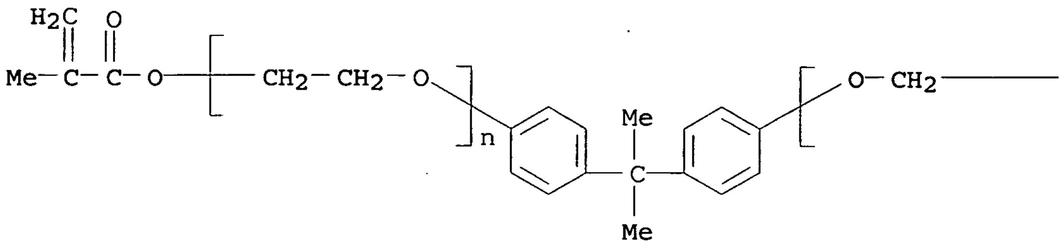
L34  ANSWER 4 OF 31  HCAPLUS  COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER:        2004:1128879  HCAPLUS
DOCUMENT NUMBER:         142:82300
TITLE:                   Photosensitive resin composition prepared from
                         polysiloxanediamine, dry film, and fabricated
                         components therefrom
INVENTOR(S):             Funaki, Katsuhiko; Tahara, Shuji; Fujita,
                         Kazuto; Tsuda, Takeshi; Okawado, Etsuo
PATENT ASSIGNEE(S):      Mitsui Chemicals Inc., Japan
SOURCE:                  Jpn. Kokai Tokkyo Koho, 17 pp.
                         CODEN: JKXXAF
DOCUMENT TYPE:           Patent
LANGUAGE:                Japanese
FAMILY ACC. NUM. COUNT:  1
PATENT INFORMATION:

     PATENT NO.          KIND   DATE       APPLICATION NO.        DATE
     ---------------     ----   --------   --------------------
     --------
     JP 2004361883        A2    20041224   JP 2003-163332
                                                                  2003
                                                                  0609
PRIORITY APPLN. INFO.:                     JP 2003-163332
                                                                  2003
                                                                  0609

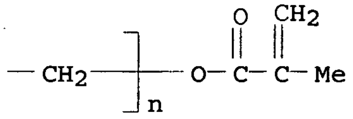
OTHER SOURCE(S):         MARPAT 142:82300
AB   Disclosed is the photosensitive resin composition comprising (a)
     polyamic acid obtained from H2NR1SiR2R2(O-SiR2R2)nR1NH2 (R1 =
     C1-10 hydrocarbon; R2 = C1-6 alkyl, aromatic; and n = 1-30), (b) a
     (meth)acrylate compound having ≥2 photopolymerizable unsatd.
     double bond, (c) a photopolymn. initiator, and (d) a P-containing
     fire-retardant. The dry film is prepared from the composition, and a
     polyimide film prepared from the dry film is formed on a flexible
     printed circuit board. The composition free of halogen compds. and Sb
     compds. is environmentally friendly.
IT   41637-38-1DP, FA 321M, polymers with 3-aminopropyl
     group-terminated Me Ph polysiloxanes, Bis(3-aminophenoxy)biphenyl,
     BPE 1300N, pentaerythritol triacrylate, pyromellitic dianhydride
     and A-BPE-10 64401-02-1DP, A-BPE 10, polymers with
     3-aminopropyl group-terminated Me Ph polysiloxanes,
     Bis(3-aminophenoxy)biphenyl, FA 321M, BPE 1300N, pyromellitic
     dianhydride and pentaerythritol triacrylate 811442-32-7P
     , Pyromellitic dianhydride-BY 16-853U-1,3-bis(3-
     aminophenoxy)benzene-FA 321M-pentaerythritol triacrylate copolymer
     811442-34-9P 812665-43-3P, Pyromellitic
     dianhydride-1,3-bis(3-aminopropyl)tetramethylsiloxane-1,3-bis[3-
     (aminophenoxy)phenoxy]benzene-FA 321M-FAP 328M copolymer
        (photosensitive resin composition prepared from polysiloxanediamine
        for solder resist us ed for fabrication of flexible printed
        circuit board)
RN   41637-38-1  HCAPLUS
CN   Poly(oxy-1,2-ethanediyl), α,α'-[(1-methylethylidene)di-
```

4,1-phenylene]bis[ω-[(2-methyl-1-oxo-2-propenyl)oxy]- (9CI)
(CA INDEX NAME)

PAGE 1-A

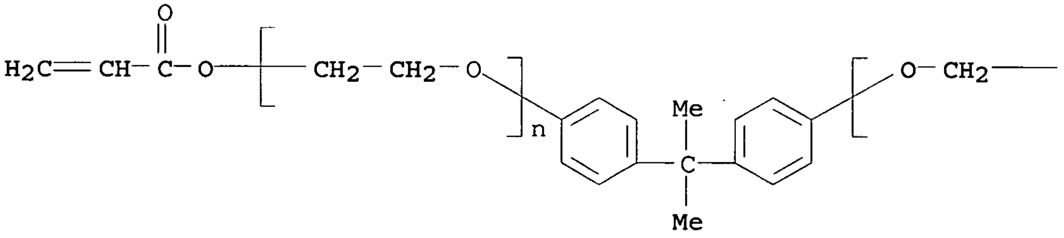


PAGE 1-B

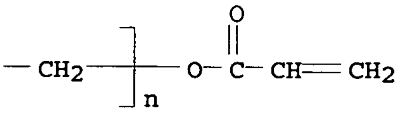


RN 64401-02-1 HCAPLUS
CN Poly(oxy-1,2-ethanediyl), α,α'-[(1-methylethylidene)di-4,1-phenylene]bis[ω-[(1-oxo-2-propenyl)oxy]- (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B

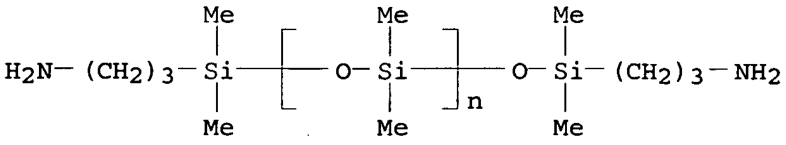


RN 811442-32-7 HCAPLUS
CN 2-Propenoic acid, 2-(hydroxymethyl)-2-[[(1-oxo-2-propenyl)oxy]methyl]-1,3-propanediyl ester, polymer with α-[(3-aminopropyl)dimethylsilyl]-ω-[[(3-aminopropyl)dimethylsilyl]oxy]poly[oxy(dimethylsilylene)], 1H,3H-benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, α,α'-[(1-methylethylidene)di-4,1-phenylene]bis[ω-[(2-methyl-1-oxo-2-propenyl)oxy]poly(oxy-1,2-ethanediyl)] and

3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

CM 1

CRN 97917-34-5
CMF (C2 H6 O Si)n C10 H28 N2 O Si2
CCI PMS

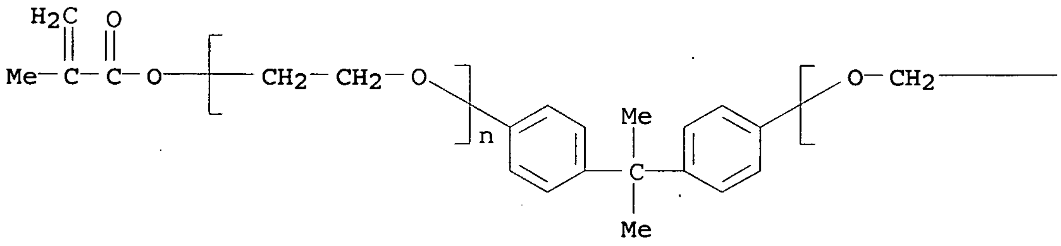


$$H_2N-(CH_2)_3-\underset{Me}{\overset{Me}{Si}}-\left[O-\underset{Me}{\overset{Me}{Si}}\right]_n-O-\underset{Me}{\overset{Me}{Si}}-(CH_2)_3-NH_2$$

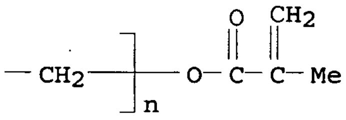
CM 2

CRN 41637-38-1
CMF (C2 H4 O)n (C2 H4 O)n C23 H24 O4
CCI PMS

PAGE 1-A

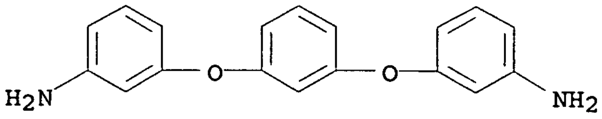


PAGE 1-B



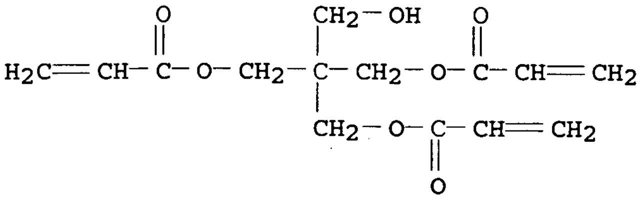
CM 3

CRN 10526-07-5
CMF C18 H16 N2 O2



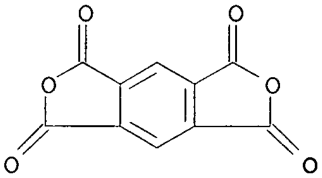
CM 4

CRN 3524-68-3
CMF C14 H18 O7



CM 5

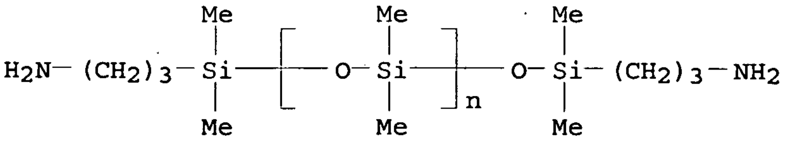
CRN 89-32-7
CMF C10 H2 O6



RN 811442-34-9 HCAPLUS
CN 2-Propenoic acid, [dihydro-5-(2-hydroxyethyl)-2,4,6-trioxo-1,3,5-triazine-1,3(2H,4H)-diyl]di-2,1-ethanediyl ester, polymer with α-[(3-aminopropyl)dimethylsilyl]-ω-[[(3-aminopropyl)dimethylsilyl]oxy]poly[oxy(dimethylsilylene)], 1H,3H-benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, α,α'-[(1-methylethylidene)di-4,1-phenylene]bis[ω-[(2-methyl-1-oxo-2-propenyl)oxy]poly(oxy-1,2-ethanediyl)] and 3,3'-[1,3-phenylenebis(oxy)]bis[benzenamine] (9CI) (CA INDEX NAME)

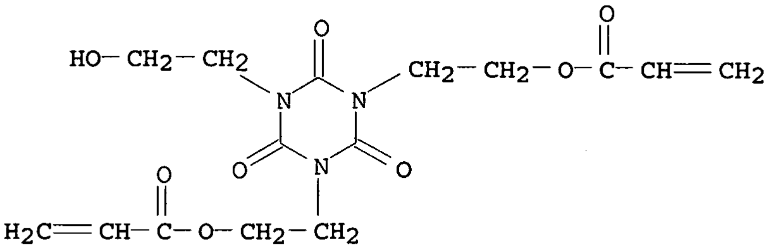
CM 1

CRN 97917-34-5
CMF (C2 H6 O Si)n C10 H28 N2 O Si2
CCI PMS



CM 2

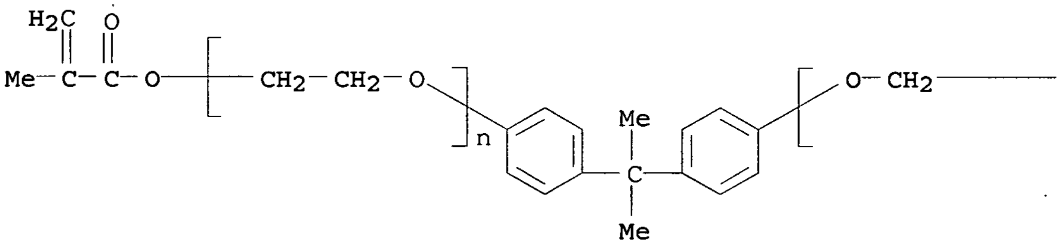
CRN 87605-70-7
CMF C15 H19 N3 O8



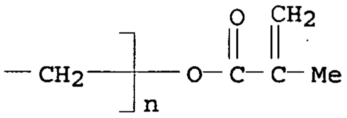
CM 3

CRN 41637-38-1
CMF (C2 H4 O)n (C2 H4 O)n C23 H24 O4
CCI PMS

PAGE 1-A

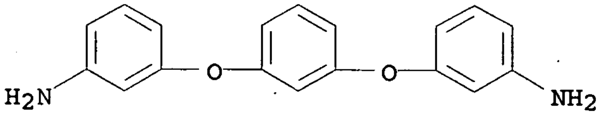


PAGE 1-B



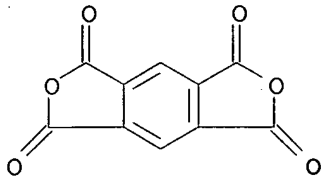
CM 4

CRN 10526-07-5
CMF C18 H16 N2 O2



CM 5

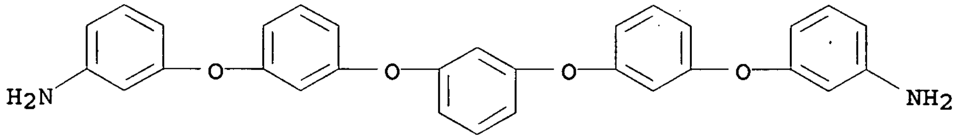
CRN 89-32-7
CMF C10 H2 O6



RN 812665-43-3 HCAPLUS
CN 1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone, polymer with α,α'-[(1-methylethylidene)di-4,1-phenylene]bis[ω-[(2-methyl-1-oxo-2-propenyl)oxy]poly(oxy-1,2-ethanediyl)], α,α'-[(1-methylethylidene)di-4,1-phenylene]bis[ω-[(2-methyl-1-oxo-2-propenyl)oxy]poly[oxy(methyl-1,2-ethanediyl)]], 3,3'-[1,3-phenylenebis(oxy-3,1-phenyleneoxy)]bis[benzenamine] and 3,3'-(1,1,3,3-tetramethyl-1,3-disiloxanediyl)bis[1-propanamine] (9CI) (CA INDEX NAME)

CM 1

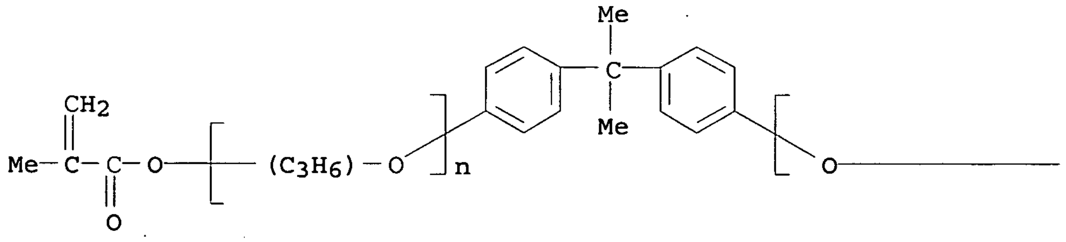
CRN 500577-28-6
CMF C30 H24 N2 O4



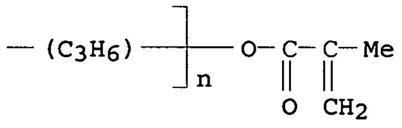
CM 2

CRN 42610-22-0
CMF (C3 H6 O)n (C3 H6 O)n C23 H24 O4
CCI IDS, PMS

PAGE 1-A



PAGE 1-B

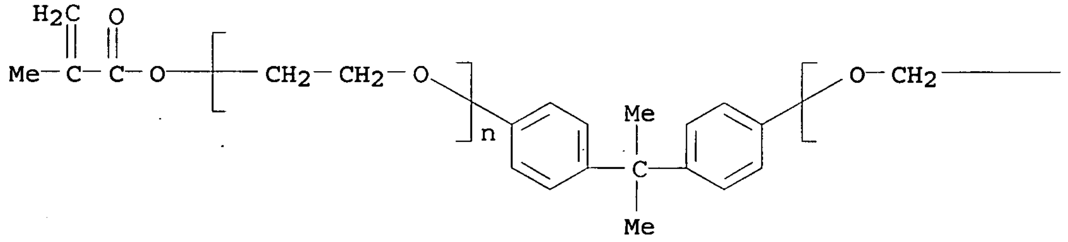


$-(C_3H_6)_n-O-C(=O)-C(=CH_2)-Me$

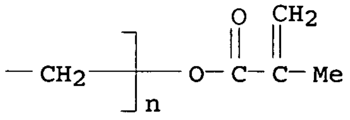
CM 3

CRN 41637-38-1
CMF (C2 H4 O)n (C2 H4 O)n C23 H24 O4
CCI PMS

PAGE 1-A



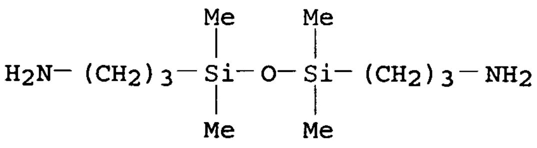
PAGE 1-B



$-CH_2-]_n-O-C(=O)-C(=CH_2)-Me$

CM 4

CRN 2469-55-8
CMF C10 H28 N2 O Si2

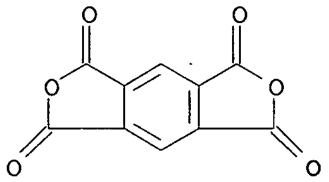


$H_2N-(CH_2)_3-Si(Me)_2-O-Si(Me)_2-(CH_2)_3-NH_2$

CM 5

CRN 89-32-7

CMF C10 H2 O6



IC ICM G03F007-037
ICS C08G073-10; G03F007-004; G03F007-027; G03F007-075; H05K003-00
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 35, 38, 76
IT **Fireproofing** agents
Photoimaging materials
Resists
Solder resists
(photosensitive resin composition prepared from polysiloxanediamine for solder resist us ed for fabrication of flexible printed circuit board)
IT 75980-60-8, 2,4,6-**Trimethylbenzoyldiphenylphosphineoxide**
(photopolymn initiator; photosensitive resin composition prepared from polysiloxanediamine for solder resist us ed for fabrication of flexible printed circuit board)
IT 89-32-7DP, Pyromellitic dianhydride, polymers with 3-aminopropyl group-terminated Me Ph polysiloxanes, 4,4'-bis(3-aminophenoxy)biphenyl, FA 321M, BPE 1300N, pentaerythritol triacrylate and A-BPE-10 3524-68-3DP, Pentaerythritol triacrylate, polymers with 3-aminopropyl group-terminated Me Ph polysiloxanes, Bis(3-aminophenoxy)biphenyl, FA 321M, BPE 1300N, pyromellitic dianhydride and A-BPE-10 **41637-38-1DP**, FA 321M, polymers with 3-aminopropyl group-terminated Me Ph polysiloxanes, Bis(3-aminophenoxy)biphenyl, BPE 1300N, pentaerythritol triacrylate, pyromellitic dianhydride and A-BPE-10 **41637-38-1DP**, BPE 1300N, polymers with 3-aminopropyl group-terminated Me Ph polysiloxanes, Bis(3-aminophenoxy)biphenyl, FA 321M, pentaerythritol triacrylate, pyromellitic dianhydride and A-BPE-10 **64401-02-1DP**, A-BPE 10, polymers with 3-aminopropyl group-terminated Me Ph polysiloxanes, Bis(3-aminophenoxy)biphenyl, FA 321M, BPE 1300N, pyromellitic dianhydride and pentaerythritol triacrylate 105112-76-3DP, polymers with 3-aminopropyl group-terminated Me Ph polysiloxanes, FA 321M, BPE 1300N, pentaerythritol triacrylate, pyromellitic dianhydride and A-BPE-10 **811442-32-7P**, Pyromellitic dianhydride-BY 16-853U-1,3-bis(3-aminophenoxy)benzene-FA 321M-pentaerythritol triacrylate copolymer **811442-34-9P** **812665-43-3P**, Pyromellitic dianhydride-1,3-bis(3-aminopropyl)tetramethylsiloxane-1,3-bis[3-(aminophenoxy)phenoxy]benzene-FA 321M-FAP 328M copolymer
(photosensitive resin composition prepared from polysiloxanediamine for solder resist us ed for fabrication of flexible printed circuit board)

L34 ANSWER 5 OF 31 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2004:451046 HCAPLUS
DOCUMENT NUMBER: 141:31081
TITLE: Halogen-free **flame-retardant**

photosensitive resin compositions and their photosensitive dry film resists and flexible printed circuit boards

INVENTOR(S): Okada, Koji; Yamanaka, Toshio; Takagawara, Kaoru; Takiguchi, Tomki
PATENT ASSIGNEE(S): Kanegafuchi Chemical Industry Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 45 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

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     PATENT NO.          KIND   DATE         APPLICATION NO.         DATE
     ---------------     ----   --------     --------------------
     --------
     JP 2004157188        A2    20040603     JP 2002-320353
                                                                     2002
                                                                     1101
PRIORITY APPLN. INFO.:                       JP 2002-320353
                                                                     2002
                                                                     1101
```

OTHER SOURCE(S): MARPAT 141:31081

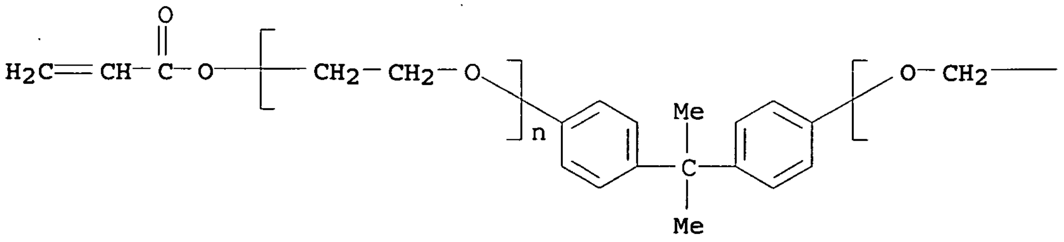
AB The photosensitive resin compns. contain photoreaction initiators and **flame retardants** comprising organic P-based compns. composed of HO-containing phosphoine oxides and epoxy compds. bearing reactive double bonds, or organic P-based compns. containing compds. obtained by reacting these compds. Preferably, the **phosphine** oxides comprise R1R2R3P:O (R1-R3 = C1-20 organic group; ≥1 of R1-R3 contain ≥1 OH) and the epoxy compds. comprise those containing acryloyl, methacryloyl, allyl, and/or vinyl groups. Preferably, the photosensitive resin compns. contain alkali-soluble resins, more preferably, polyimides. The photosensitive dry film resists formed from the photosensitive resin compns. are useful for cover lay films of printed circuit boards.

IT **64401-02-1**, NK Ester A-BPE 30
(NK Ester A-BPE 30, A-BPE 10; halogen-free **flame-retardant** photosensitive resin compns. for dry film resists and cover lay films of flexible printed circuit boards)

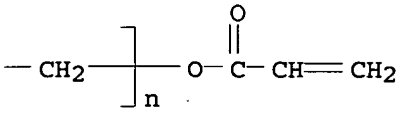
RN 64401-02-1 HCAPLUS

CN Poly(oxy-1,2-ethanediyl), α,α'-[(1-methylethylidene)di-4,1-phenylene]bis[ω-[(1-oxo-2-propenyl)oxy]- (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



$-CH_2-]_n-O-\overset{O}{\overset{\|}{C}}-CH=CH_2$

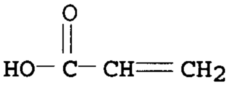
IT 135152-86-2DP, NK Oligo EA 1010, reaction products with
n-butylbis(3-hydroxypropyl)**phosphine** oxide
(NK Oligo EA 1010; halogen-free **flame-retardant** photosensitive resin compns. for dry film
resists and cover lay films of flexible printed circuit boards)

RN 135152-86-2 HCAPLUS

CN Oxirane, 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis-, homopolymer, mono-2-propenoate (9CI)
(CA INDEX NAME)

CM 1

CRN 79-10-7
CMF C3 H4 O2



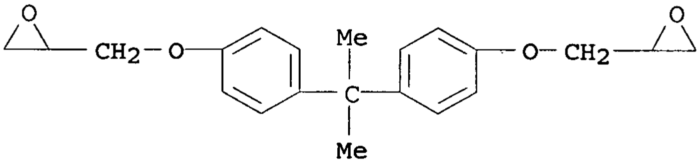
$HO-\overset{O}{\overset{\|}{C}}-CH=CH_2$

CM 2

CRN 25085-99-8
CMF (C21 H24 O4)x
CCI PMS

CM 3

CRN 1675-54-3
CMF C21 H24 O4



IC ICM G03F007-004
ICS G03F007-027; H05K003-00; H05K003-06; H05K003-28

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 76

ST hydroxy **phosphine** oxide **flame retardant** photoresist; epoxide **phosphine** oxide deriv **fireproofing** agent; dry film resist polyimide flame retardance; flexible printed circuit cover lay polyimide

IT Photoresists

```
        (dry-film; halogen-free flame-retardant
        photosensitive resin compns. for dry film resists and cover lay
        films of flexible printed circuit boards)
IT   Fireproofing agents
        (epoxide-phosphine oxide blend or reaction product;
        halogen-free flame-retardant photosensitive
        resin compns. for dry film resists and cover lay films of
        flexible printed circuit boards)
IT   Printed circuit boards
        (flexible; halogen-free flame-retardant
        photosensitive resin compns. for dry film resists and cover lay
        films of flexible printed circuit boards)
IT   Polysiloxanes, preparation
        (polyether-polyimide-polysulfone-; halogen-free flame
        -retardant photosensitive resin compns. for dry film
        resists and cover lay films of flexible printed circuit boards)
IT   Polysulfones, preparation
        (polyether-polyimide-siloxane-; halogen-free flame-
        retardant photosensitive resin compns. for dry film
        resists and cover lay films of flexible printed circuit boards)
IT   Polyimides, preparation
        (polyether-polysulfone-siloxane-; halogen-free flame-
        retardant photosensitive resin compns. for dry film
        resists and cover lay films of flexible printed circuit boards)
IT   Polyethers, preparation
        (polyimide-polysulfone-siloxane-; halogen-free flame-
        retardant photosensitive resin compns. for dry film
        resists and cover lay films of flexible printed circuit boards)
IT   64401-02-1, NK Ester A-BPE 30
        (NK Ester A-BPE 30, A-BPE 10; halogen-free flame-
        retardant photosensitive resin compns. for dry film
        resists and cover lay films of flexible printed circuit boards)
IT   135152-86-2DP, NK Oligo EA 1010, reaction products with
     n-butylbis(3-hydroxypropyl)phosphine oxide
        (NK Oligo EA 1010; halogen-free flame-
        retardant photosensitive resin compns. for dry film
        resists and cover lay films of flexible printed circuit boards)
IT   532435-38-4DP, Kayarad EAM 2160, reaction products with
     n-butylbis(3-hydroxypropyl)phosphine oxide
     690254-92-3P
        (halogen-free flame-retardant
        photosensitive resin compns. for dry film resists and cover lay
        films of flexible printed circuit boards)
IT   106-91-2DP, Glycidyl methacrylate, reaction products with
     polyimides   624738-90-5DP, [Bis(4-amino-3-carboxy)phenyl]methane-
     bis[4-(3-aminophenoxy)phenyl] sulfone-[2,2'-bis(4-
     hydroxyphenyl)propane dibenzoate]-3,3',4,4'-tetracarboxylic
     dianhydride-KF 8010 copolymer, reaction products with glycidyl
     methacrylate   697806-23-8DP, reaction products with glycidyl
     methacrylate and NK Oligo EA 1010
        (halogen-free flame-retardant
        photosensitive resin compns. for dry film resists and cover lay
        films of flexible printed circuit boards)
IT   106-91-2, Glycidyl methacrylate   6779-58-4
        (halogen-free flame-retardant
        photosensitive resin compns. for dry film resists and cover lay
        films of flexible printed circuit boards)
IT   87605-70-7, Aronix M 215
        (halogen-free flame-retardant
        photosensitive resin compns. for dry film resists and cover lay
```

films of flexible printed circuit boards)

IT 162881-26-7, Bis(2,4,6-trimethylbenzoyl)**phenylphosphine** oxide
(photoreaction initiator; halogen-free **flame-retardant** photosensitive resin compns. for dry film resists and cover lay films of flexible printed circuit boards)

L34 ANSWER 6 OF 31 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2004:414429 HCAPLUS
DOCUMENT NUMBER: 140:407919
TITLE: Hydroxy-containing organophosphorus compositions, their **fireproofing** agents, **fireproofing** thermoplastic and/or thermosetting resin compositions, and electronic parts
INVENTOR(S): Yamanaka, Toshio; Okada, Yoshifumi; Takakawara, Kaoru; Takiguchi, Tomoki
PATENT ASSIGNEE(S): Nippon Pelnox Corporation, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004143286	A2	20040520	JP 2002-309602	2002 1024
PRIORITY APPLN. INFO.:			JP 2002-309602	2002 1024

OTHER SOURCE(S): MARPAT 140:407919

AB The organophosphorus compns. contain (A) P(O)R1R2R3 (I; R1-R3 = C1-20 organic group; ≥1 of R1-R3 = ≥1-OH-containing group) and epoxy compds. bearing reactive double bonds, or (B) reaction products of I with the epoxy compds. Thus, 8 sheets of kraft paper impregnated with a varnish containing Iupilon S 2000N (polycarbonate) and P(O)Bu[(CH2)3OCH2CH(OH)CH2O2CCMe:CH2]2 [reaction product of I [R1 = Bu, R2 = R3 = (CH2)3OH] with glycidyl methacrylate] were laminated and hot-pressed to give a test piece showing fire resistance (UL 94) V-0, good heat and moisture resistance.

IT **135152-86-2DP**, Bisphenol A diglycidyl ether homopolymer monoacrylate, ether with butylbis(3-hydroxypropyl) **phosphine** oxide
(OH-containing organophosphorus compns. as **fireproofing** agents for thermoplastic and/or thermosetting resin electronic parts with good fire, heat, and moisture resistance)

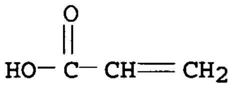
RN 135152-86-2 HCAPLUS

CN Oxirane, 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis-, homopolymer, mono-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 79-10-7

CMF C3 H4 O2



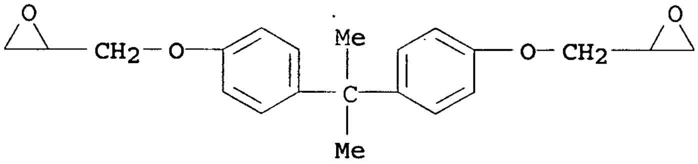
$HO-\overset{O}{\overset{\|}{C}}-CH=CH_2$

CM 2

CRN 25085-99-8
CMF (C21 H24 O4)x
CCI PMS

CM 3

CRN 1675-54-3
CMF C21 H24 O4



(OH-contg. organophosphorus compns. as **fireproofing** agents for thermoplastic and/or thermosetting resin electronic parts with good fire, heat, and moisture resistance

IC ICM C09K021-12
ICS C07F009-53; C08F291-00; C08K005-1515; C08K005-5397; C08L101-00

CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 23, 35, 37, 76

ST **phosphine** oxide epoxy **fireproofing** thermoplastic elec; **butylbishydroxypropylphosphine** oxide glycidyl methacrylate **fireproofing** polycarbonate; heat resistance **fireproofing** epoxy **phosphine** oxide; water resistance **fireproofing** epoxy **phosphine** oxide

IT Electric apparatus
Fireproofing agents
Water-resistant materials
(OH-containing organophosphorus compns. as **fireproofing** agents for thermoplastic and/or thermosetting resin electronic parts with good fire, heat, and moisture resistance)

IT Fluoropolymers, uses
(OH-containing organophosphorus compns. as **fireproofing** agents for thermoplastic and/or thermosetting resin electronic parts with good fire, heat, and moisture resistance)

IT Epoxy resins, preparation
(acrylates; OH-containing organophosphorus compns. as **fireproofing** agents for thermoplastic and/or thermosetting resin electronic parts with good fire, heat, and moisture resistance)

IT Polycarbonates, uses
(aromatic; OH-containing organophosphorus compns. as

fireproofing agents for thermoplastic and/or thermosetting resin electronic parts with good fire, heat, and moisture resistance)

IT Phenolic resins, uses
(epoxy, novolak, polymers with OH- and double bond-containing **phosphine** oxides, crosslinked; OH-containing organophosphorus compns. as **fireproofing** agents for thermoplastic and/or thermosetting resin electronic parts with good fire, heat, and moisture resistance)

IT Heat-resistant materials
(fire-resistant; OH-containing organophosphorus compns. as **fireproofing** agents for thermoplastic and/or thermosetting resin electronic parts with good fire, heat, and moisture resistance)

IT Fire-resistant materials
(heat-resistant; OH-containing organophosphorus compns. as **fireproofing** agents for thermoplastic and/or thermosetting resin electronic parts with good fire, heat, and moisture resistance)

IT Epoxy resins, uses
(phenolic, novolak, polymers with OH- and double bond-containing **phosphine** oxides, crosslinked; OH-containing organophosphorus compns. as **fireproofing** agents for thermoplastic and/or thermosetting resin electronic parts with good fire, heat, and moisture resistance)

IT Polysulfones, uses
(polyester-polyimide-polysiloxane-; OH-containing organophosphorus compns. as **fireproofing** agents for thermoplastic and/or thermosetting resin electronic parts with good fire, heat, and moisture resistance)

IT Polysiloxanes, uses
(polyester-polyimide-polysulfone-; OH-containing organophosphorus compns. as **fireproofing** agents for thermoplastic and/or thermosetting resin electronic parts with good fire, heat, and moisture resistance)

IT Polyimides, uses
(polyester-polysiloxane-polysulfone-; OH-containing organophosphorus compns. as **fireproofing** agents for thermoplastic and/or thermosetting resin electronic parts with good fire, heat, and moisture resistance)

IT Polyesters, uses
(polyimide-polysiloxane-polysulfone-; OH-containing organophosphorus compns. as **fireproofing** agents for thermoplastic and/or thermosetting resin electronic parts with good fire, heat, and moisture resistance)

IT 690254-93-4P
(OH-containing organophosphorus compns. as **fireproofing** agents for thermoplastic and/or thermosetting resin electronic parts with good fire, heat, and moisture resistance)

IT 624738-90-5P, [Bis(4-amino-3-carboxy)phenyl]methane-bis[4-(3-aminophenoxy)phenyl]sulfone-[2,2'-bis(4-hydroxyphenyl)propane dibenzoate]-3,3',4,4'-tetracarboxylic dianhydride-KF 8010 copolymer
(OH-containing organophosphorus compns. as **fireproofing** agents for thermoplastic and/or thermosetting resin electronic parts with good fire, heat, and moisture resistance)

IT **135152-86-2DP**, Bisphenol A diglycidyl ether homopolymer monoacrylate, ether with butylbis(3-hydroxypropyl) **phosphine** oxide 690254-92-3P
(OH-containing organophosphorus compns. as **fireproofing**

agents for thermoplastic and/or thermosetting resin electronic parts with good fire, heat, and moisture resistance)

IT **135152-86-2DP**, ether with butylbis(3-hydroxypropyl) **phosphine** oxide, polymer with cresol novolak epoxy resin
(OH-containing organophosphorus compns. as **fireproofing** agents for thermoplastic and/or thermosetting resin electronic parts with good fire, heat, and moisture resistance)

IT 223482-46-0, Iupilon S 2000N
(OH-containing organophosphorus compns. as **fireproofing** agents for thermoplastic and/or thermosetting resin electronic parts with good fire, heat, and moisture resistance)

IT 106-91-2, Glycidyl methacrylate 6779-58-4, Butylbis(3-hydroxypropyl)**phosphine** oxide
(OH-containing organophosphorus compns. as **fireproofing** agents for thermoplastic and/or thermosetting resin electronic parts with good fire, heat, and moisture resistance)

IT 9016-83-5DP, Cresol-formaldehyde copolymer, glycidyl ethers, polymers with OH- and double bond-containing **phosphine** oxides 690254-93-4DP, polymer with cresol novolak epoxy resin
(crosslinked; OH-containing organophosphorus compns. as **fireproofing** agents for thermoplastic and/or thermosetting resin electronic parts with good fire, heat, and moisture resistance)

L34 ANSWER 7 OF 31 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER:	2004:310135 HCAPLUS
DOCUMENT NUMBER:	140:322575
TITLE:	Halogen-free acrylic polymer adhesive compositions with good fire resistance, their adhesive films, and polyimide films having adhesive layers
INVENTOR(S):	Ito, Toshihiko; Tanaka, Masaru
PATENT ASSIGNEE(S):	Hitachi Chemical Co., Ltd., Japan
SOURCE:	Jpn. Kokai Tokkyo Koho, 12 pp. CODEN: JKXXAF
DOCUMENT TYPE:	Patent
LANGUAGE:	Japanese
FAMILY ACC. NUM. COUNT:	1
PATENT INFORMATION:	

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004115612	A2	20040415	JP 2002-278950	20020925
PRIORITY APPLN. INFO.:			JP 2002-278950	20020925

OTHER SOURCE(S): MARPAT 140:322575

AB The compns., useful for printed circuit boards, contain (A) copolymers (Mw ≥500,000, Tg ≤-5°) containing acrylonitrile 15-35, glycidyl (meth)acrylate 0.5-4, and ≥1 (meth)acrylic acid or its derivs. 61-84.5%, (B) epoxy resins, (C) curing agents for the epoxy resins, and (D) Al-containing organophosphorus compds. Alternatively, the compns. contain copolymers containing acrylonitrile, glycidyl (meth)acrylate, and ≥1 (meth)acrylic acid or its derivs., B, C, and D, and have temperature of ≥300° where no apparent change is observed after soaking in solder for 3 min (further measurement condition given). Thus, an adhesive film comprising Kapton (polyimide film) and an adhesive layer comprising 15:2:30:53 acrylonitrile-glycidyl methacrylate-Bu acrylate-Et acrylate copolymer 533, Epikote 828 15, Plyophen F 2822 (phenolic resin) 4.8, Exolit OP 940 (Al-containing organophosphorus compound) 65, Curezol 2PZ-CN (1-cyanoethylphenylimidazole) 0.2 part was laminated with a Cu foil at 120° to give a test piece showing 180° peeling strength 1.2 kN/m, aforementioned temperature 330°, and fire resistance (UL 94) V-0.

IT **678149-65-0P**, Acrylonitrile-butyl acrylate-Epikote 828-ethyl acrylate-glycidyl methacrylate-Plyophen LF 2822 copolymer
(adhesives; halogen-free acrylic polymer adhesive compns. with good fire and solder heat resistance for polyimide adhesive films for printed circuit boards)

RN 678149-65-0 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, oxiranylmethyl ester, polymer with butyl 2-propenoate, (chloromethyl)oxirane, ethyl 2-propenoate, 4,4'-(1-methylethylidene)bis[phenol], Phenolite LF 2822 and 2-propenenitrile (9CI) (CA INDEX NAME)

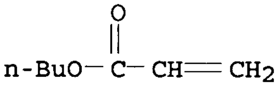
CM 1

CRN 206566-37-2
CMF Unspecified
CCI PMS, MAN

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CM 2

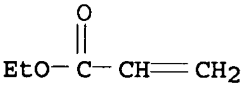
CRN 141-32-2
CMF C7 H12 O2



$n\text{-BuO}-C(=O)-CH=CH_2$

CM 3

CRN 140-88-5
CMF C5 H8 O2



$EtO-C(=O)-CH=CH_2$

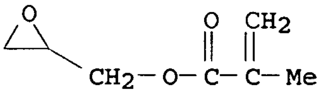
CM 4

CRN 107-13-1
CMF C3 H3 N

$H_2C{=}CH{-}C{\equiv}N$

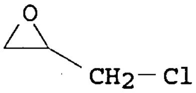
CM 5

CRN 106-91-2
CMF C7 H10 O3



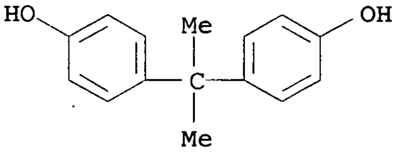
CM 6

CRN 106-89-8
CMF C3 H5 Cl O

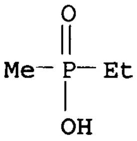


CM 7

CRN 80-05-7
CMF C15 H16 O2



IT **176316-86-2**, Exolit OP 940
(**fireproofing** agents; halogen-free acrylic polymer adhesive compns. with good fire and solder heat resistance for polyimide adhesive films for printed circuit boards)
RN 176316-86-2 HCAPLUS
CN Phosphinic acid, ethylmethyl-, aluminum salt (9CI) (CA INDEX NAME)



$Me{-}P({=}O)(OH){-}Et$

●1/3 Al

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IC    ICM  C09J163-00
      ICS  C09J007-02; C09J011-06; C09J133-00; C09J133-20
CC    38-3 (Plastics Fabrication and Uses)
      Section cross-reference(s): 76
ST    acrylic polymer adhesive aluminum organophosphorus
      fireproofing; polyimide adhesive film printed circuit
      board; aluminum ethylmethylphosphinate
      fireproofing acrylic polymer adhesive; epoxy phenolic
      acrylic adhesive polyimide film; solder heat resistance polyimide
      adhesive film; halogen free fireproofing acrylic
      adhesive polyimide film
IT    Fireproofing agents
         (Al-containing organophosphorus compds.; halogen-free acrylic
         polymer adhesive compns. with good fire and solder heat
         resistance for polyimide adhesive films for printed circuit
         boards)
IT    678149-65-0P, Acrylonitrile-butyl acrylate-Epikote
      828-ethyl acrylate-glycidyl methacrylate-Plyophen LF 2822
      copolymer
         (adhesives; halogen-free acrylic polymer adhesive compns. with
         good fire and solder heat resistance for polyimide adhesive
         films for printed circuit boards)
IT    176316-86-2, Exolit OP 940
         (fireproofing agents; halogen-free acrylic polymer
         adhesive compns. with good fire and solder heat resistance for
         polyimide adhesive films for printed circuit boards)

L34  ANSWER 8 OF 31  HCAPLUS  COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER:         2003:771526  HCAPLUS
DOCUMENT NUMBER:          139:277758
TITLE:                    Halogen-free alkali-developable photocurable
                          and thermosetting novolak compositions with
                          good fire resistance
INVENTOR(S):              Iwasa, Aiko; Nita, Hiroshi; Yoda, Kyoichi;
                          Nagano, Taku; Inagaki, Hitoshi
PATENT ASSIGNEE(S):       Taiyo Ink Mfg Co., Ltd., Japan
SOURCE:                   Jpn. Kokai Tokkyo Koho, 12 pp.
                          CODEN: JKXXAF
DOCUMENT TYPE:            Patent
LANGUAGE:                 Japanese
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

      PATENT NO.          KIND   DATE         APPLICATION NO.        DATE
      ---------------     ----   --------     --------------------
      --------
      JP 2003277470        A2    20031002     JP 2002-81536
                                                                     2002
                                                                     0322
PRIORITY APPLN. INFO.:                        JP 2002-81536
                                                                     2002
                                                                     0322

OTHER SOURCE(S):          MARPAT 139:277758
AB    The compns., useful for solder resists and interlayer dielec.
      films for printed circuit boards, contain (A) photosensitive
      carboxy-containing resins manufactured by reaction of unsatd. group-containing
      monocaboxylic acids with novolak-alkylene oxide adducts and
      subsequent reaction of polybasic acid anhydrides with the
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resulting esters, (B) photoinitiators, (C) photosensitive (meth)acrylates, (D) epoxy compds., (E) solvents, and (F) reaction products of quinones with organophosphorus compds. bearing one active H bonded to P.

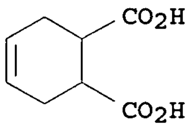
IT **607387-84-8P**, Propylene oxide-Shonol CRG 951 graft copolymer acrylate, ester with tetrahydrophthalic anhydride
(halogen-free alkali-developable photocurable and thermosetting novolak compns. with good fire resistance for solder resists and interlayer dielec. films for printed circuit boards)

RN 607387-84-8 HCAPLUS

CN Formaldehyde, polymer with methyloxirane and 2-methylphenol, hydrogen 4-cyclohexene-1,2-dicarboxylate 2-propenoate, graft (9CI) (CA INDEX NAME)

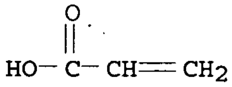
CM 1

CRN 88-98-2
CMF C8 H10 O4



CM 2

CRN 79-10-7
CMF C3 H4 O2



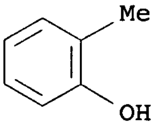
$HO-C(=O)-CH=CH_2$

CM 3

CRN 142663-35-2
CMF (C7 H8 O . C3 H6 O . C H2 O)x
CCI PMS

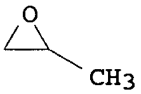
CM 4

CRN 95-48-7
CMF C7 H8 O



CM 5

CRN 75-56-9
CMF C3 H6 O



CM 6

CRN 50-00-0
CMF C H2 O

$H_2C=O$

IT **607387-86-0P**, DPHA-Epo Tohto YDCN 704P-propylene oxide-Shonol CRG 951 graft copolymer acrylate, ester with tetrahydrophthalic anhydride-RE 36 copolymer
(halogen-free alkali-developable photocurable and thermosetting novolak compns. with good fire resistance for solder resists and interlayer dielec. films for printed circuit boards)
RN 607387-86-0 HCAPLUS
CN 2-Propenoic acid, 2-[[3-[(1-oxo-2-propenyl)oxy]-2,2-bis[[(1-oxo-2-propenyl)oxy]methyl]propoxy]methyl]-2-[[(1-oxo-2-propenyl)oxy]methyl]-1,3-propanediyl ester, polymer with Epo Tohto YDCN 704P, formaldehyde graft polymer with methyloxirane and 2-methylphenol hydrogen 4-cyclohexene-1,2-dicarboxylate 2-propenoate, and RE 306 (epoxy resin) (9CI) (CA INDEX NAME)

CM 1

CRN 161544-94-1
CMF Unspecified
CCI PMS, MAN

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

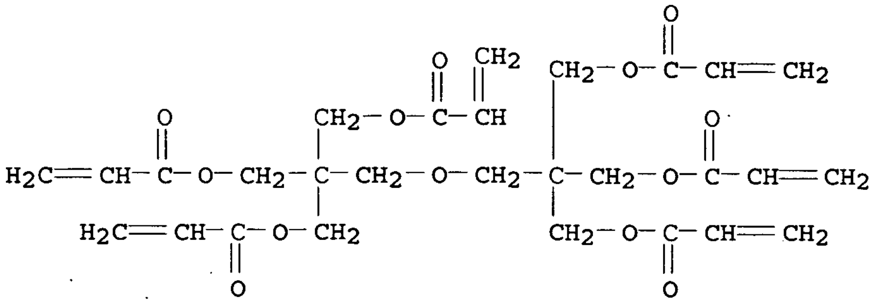
CM 2

CRN 156107-88-9
CMF Unspecified
CCI PMS, MAN

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CM 3

CRN 29570-58-9
CMF C28 H34 O13

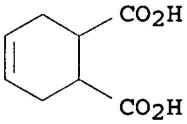


CM 4

CRN 607387-84-8
CMF C8 H10 O4 . x (C7 H8 O . C3 H6 O . C H2 O)x . x C3 H4 O2

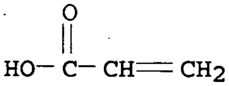
CM 5

CRN 88-98-2
CMF C8 H10 O4



CM 6

CRN 79-10-7
CMF C3 H4 O2

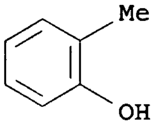


CM 7

CRN 142663-35-2
CMF (C7 H8 O . C3 H6 O . C H2 O)x
CCI PMS

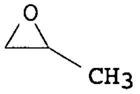
CM 8

CRN 95-48-7
CMF C7 H8 O



CM 9

CRN 75-56-9
CMF C3 H6 O



CM 10

CRN 50-00-0
CMF C H2 O

$H_2C{=}O$

IC ICM C08G059-18
ICS C08K005-53; C08L061-14; C08L063-00; G03F007-004; G03F007-027; H05K003-28
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 74, 76
ST novolak solder resist printed circuit board; organophosphorus quinone **fireproofing** agent novolak solder resist; epoxy novolak polyoxyalkylene acrylate solder resist; dielec film photoresist thermosetting novolak fire resistance
IT **Fireproofing** agents
(reaction products of organophosphorous compds. with quinones; halogen-free alkali-developable photocurable and thermosetting novolak compns. with good fire resistance)
IT 106-51-4DP, 1,4-Benzoquinone, reaction product with **diphenylphosphine** oxide 130-15-4DP, 1,4-Naphthoquinone, reaction product with dihydroxaphosphaphenanthrenoxide 4559-70-0DP, **Diphenylphosphine** oxide, reaction product with benzoquinone 35948-25-5DP, HCA, reaction product with naphthoquionone
(**fireproofing** agents; halogen-free alkali-developable photocurable and thermosetting novolak compns. with good fire resistance for solder resists and interlayer dielec. films for printed circuit boards)
IT **607387-84-8P**, Propylene oxide-Shonol CRG 951 graft copolymer acrylate, ester with tetrahydrophthalic anhydride 607387-85-9P, Propylene oxide-Resitop PSF 2803 graft copolymer acrylate, ester with tetrahydrophthalic anhydride
(halogen-free alkali-developable photocurable and thermosetting novolak compns. with good fire resistance for solder resists and interlayer dielec. films for printed circuit boards)

IT **607387-86-0P**, DPHA-Epo Tohto YDCN 704P-propylene oxide-Shonol CRG 951 graft copolymer acrylate, ester with tetrahydrophthalic anhydride-RE 36 copolymer 607387-87-1P, DPHA-Epo Tohto YDCN 704P-propylene oxide-Resitop PSF 2803 graft copolymer acrylate, ester with tetrahydrophthalic anhydride-RE 306 copolymer
(halogen-free alkali-developable photocurable and thermosetting novolak compns. with good fire resistance for solder resists and interlayer dielec. films for printed circuit boards)

L34 ANSWER 9 OF 31 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:174280 HCAPLUS
DOCUMENT NUMBER: 138:206178
TITLE: Bromine-containing **flame retardant** acrylic oligomers for coating or adhesive of optical fiber, lens, and communication device
INVENTOR(S): Fan, Mingxin; Ceska, Gary; Horgan, James
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 4 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003044618	A1	20030306	US 2001-932492	2001 0817
PRIORITY APPLN. INFO.:			US 2001-932492	2001 0817

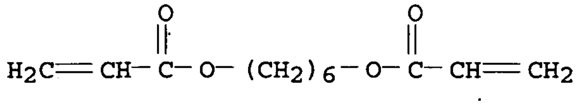
AB A polymerizable epoxy (meth)acrylate oligomer obtained by reacting (a) one or more bromine-containing epoxy resins; and (b) one or more (meth)acrylate functional acids. Thus, an oligomer was prepared by reacting DER 542 with acrylic acid and SR 238 in the presence of 4-methoxyphenol and **triphenylphosphine.**

IT **499969-30-1P**, Acrylic acid-DER 542-SR 238 copolymer
499969-31-2P, Acrylic acid-DER 560-SR 238 copolymer
(production of bromine-containing **flame retardant** acrylic oligomers for coating or adhesive of optical fiber, lens, and communication device)

RN 499969-30-1 HCAPLUS
CN 2-Propenoic acid, polymer with 1,6-hexanediyl di-2-propenoate and 2,2'-[(1-methylethylidene)bis[(2,6-dibromo-4,1-phenylene)oxymethylene]]bis[oxirane] (9CI) (CA INDEX NAME)

CM 1

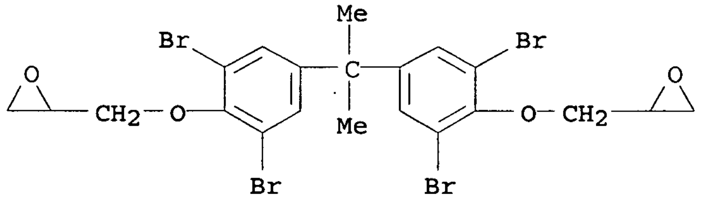
CRN 13048-33-4
CMF C12 H18 O4



$H_2C=CH-\overset{O}{\overset{\|}{C}}-O-(CH_2)_6-O-\overset{O}{\overset{\|}{C}}-CH=CH_2$

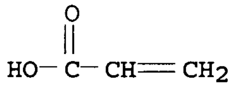
CM 2

CRN 3072-84-2
CMF C21 H20 Br4 O4



CM 3

CRN 79-10-7
CMF C3 H4 O2

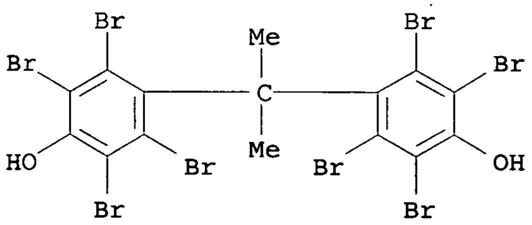


$HO-\overset{O}{\overset{\|}{C}}-CH=CH_2$

RN 499969-31-2 HCAPLUS
CN 2-Propenoic acid, polymer with (chloromethyl)oxirane, 1,6-hexanediyl di-2-propenoate and 4,4'-(1-methylethylidene)bis[2,3,5,6-tetrabromophenol] (9CI) (CA INDEX NAME)

CM 1

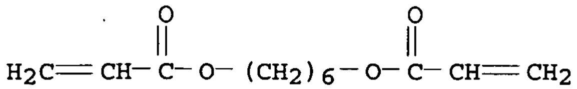
CRN 47423-36-9
CMF C15 H8 Br8 O2



CM 2

CRN 13048-33-4

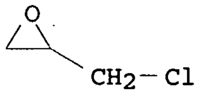
CMF C12 H18 O4



$H_2C=CH-\overset{\overset{O}{\|}}{C}-O-(CH_2)_6-O-\overset{\overset{O}{\|}}{C}-CH=CH_2$

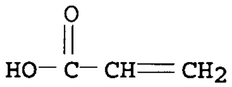
CM 3

CRN 106-89-8
CMF C3 H5 Cl O



CM 4

CRN 79-10-7
CMF C3 H4 O2



$HO-\overset{\overset{O}{\|}}{C}-CH=CH_2$

IC ICM B32B027-38
INCL 428413000
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 42, 73
ST bromine **flame retardant** acrylic oligomer
coating adhesive optical
IT Coating materials
(UV-curable; production of bromine-containing **flame retardant** acrylic oligomers for coating or adhesive of optical fiber, lens, and communication device)
IT Epoxy resins, uses
(acrylic, brominated; production of bromine-containing **flame retardant** acrylic oligomers for coating or adhesive of optical fiber, lens, and communication device)
IT Epoxy resins, uses
(bisphenol F-based, brominated; production of bromine-containing **flame retardant** acrylic oligomers for coating or adhesive of optical fiber, lens, and communication device)
IT Epoxy resins, uses
(brominated; production of bromine-containing **flame retardant** acrylic oligomers for coating or adhesive of optical fiber, lens, and communication device)
IT Optical communication
(device; production of bromine-containing **flame retardant** acrylic oligomers for coating or adhesive of optical fiber, lens, and communication device)
IT Adhesives
(photocurable; production of bromine-containing **flame**

retardant acrylic oligomers for coating or adhesive of optical fiber, lens, and communication device)

IT Fire-resistant materials
Fireproofing agents
Lenses
Optical cables
Optical fibers
(production of bromine-containing **flame retardant** acrylic oligomers for coating or adhesive of optical fiber, lens, and communication device)

IT 13048-33-4 15625-89-5, Trimethylolpropane triacrylate
28961-43-5, Ethoxylated trimethylolpropane triacrylate
42978-66-5, Tripropylene glycol diacrylate
(compatibility test monomer; production of bromine-containing **flame retardant** acrylic oligomers for coating or adhesive of optical fiber, lens, and communication device)

IT 79-94-7D, Tetrabromobisphenol A, polymers
(compatibility test monomer; production of bromine-containing **flame retardant** acrylic oligomers for coating or adhesive of optical fiber, lens, and communication device)

IT 603-35-0, **Triphenylphosphine**, uses
(**flame retardant**; production of bromine-containing **flame retardant** acrylic oligomers for coating or adhesive of optical fiber, lens, and communication device)

IT 149260-52-6, Esacure KIP 100F
(photoinitiator; production of bromine-containing **flame retardant** acrylic oligomers for coating or adhesive of optical fiber, lens, and communication device)

IT **499969-30-1P**, Acrylic acid-DER 542-SR 238 copolymer
499969-31-2P, Acrylic acid-DER 560-SR 238 copolymer
(production of bromine-containing **flame retardant** acrylic oligomers for coating or adhesive of optical fiber, lens, and communication device)

IT 150-76-5, 4-Methoxyphenol
(production of bromine-containing **flame retardant** acrylic oligomers for coating or adhesive of optical fiber, lens, and communication device)

L34 ANSWER 10 OF 31 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER:	2003:46518 HCAPLUS
DOCUMENT NUMBER:	139:277420
TITLE:	Effect of non-halogen **flame retardant** additives on the properties of vinyl ester resins and their composites
AUTHOR(S):	Malik, Mona; Choudhary, Veena; Varma, I. K.
CORPORATE SOURCE:	Centre for Polymer Science and Engineering, Indian Institute of Technology, New Delhi, 110016, India
SOURCE:	Journal of Fire Sciences (2002), 20(4), 329-342 CODEN: JFSCDV; ISSN: 0734-9041
PUBLISHER:	Sage Publications Ltd.
DOCUMENT TYPE:	Journal
LANGUAGE:	English

AB The effect of combination of char forming additives and char forming catalysts on limiting oxygen index (LOI), smoke d. and mech. properties of neat as well as glass fiber reinforced vinyl ester (VE) resins was described. Three different samples of VE resins were prepared by reacting diglycidyl ether of bisphenol-A and methacrylic acid in stoichiometric (1:2, sample A) and non-stoichiometric (1:1.7, sample B and 1:1, sample C) amts. These resins were diluted with reactive diluents (50% weight/weight) styrene (S)/glycidyl methacrylate (GMA) or a combination of GMA with S for fabrication of neat sheets as well as composites. Incorporation of **flame retardant** additives (combination of ammonium polyphosphate, azobiscarbonamide, tri(2-hydroxyethyl) isocyanurate and hydrated alumina) in the laminates increased the LOI and decreased the smoke d. values. The highest LOI was observed in laminates based on resin C containing **flame retardant** additives and a phosphorus containing amine as a hardener.

IT **81871-88-7 605619-33-8**
(effect of non-halogen **flame retardant** additives on vinyl ester resins and their composites)
RN 81871-88-7 HCAPLUS
CN Phenol, 4,4'-(1-methylethylidene)bis-, polymer with (chloromethyl)oxirane, 2-methyl-2-propenoate, polymer with ethenylbenzene (9CI) (CA INDEX NAME)

CM 1

CRN 100-42-5
CMF C8 H8

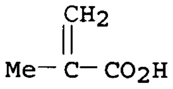
$H_2C{=}CH{-}Ph$

CM 2

CRN 61970-25-0
CMF (C15 H16 O2 . C3 H5 Cl O)x . x C4 H6 O2

CM 3

CRN 79-41-4
CMF C4 H6 O2



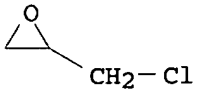
$Me{-}\overset{\overset{\displaystyle CH_2}{\|}}{C}{-}CO_2H$

CM 4

CRN 25068-38-6
CMF (C15 H16 O2 . C3 H5 Cl O)x
CCI PMS

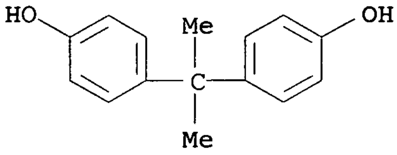
CM 5

CRN 106-89-8
CMF C3 H5 Cl O



CM 6

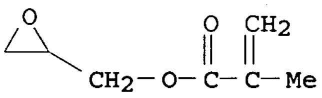
CRN 80-05-7
CMF C15 H16 O2



RN 605619-33-8 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, oxiranylmethyl ester, polymer with (chloromethyl)oxirane polymer with 4,4'-(1-methylethylidene)bis[phenol] 2-methyl-2-propenoate, and ethenylbenzene (9CI) (CA INDEX NAME)

CM 1

CRN 106-91-2
CMF C7 H10 O3



CM 2

CRN 100-42-5
CMF C8 H8

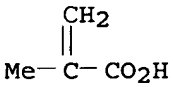
$H_2C{=}CH-Ph$

CM 3

CRN 61970-25-0
CMF (C15 H16 O2 . C3 H5 Cl O)x . x C4 H6 O2

CM 4

CRN 79-41-4
CMF C4 H6 O2



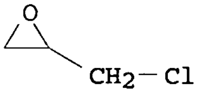
$Me-C(=CH_2)-CO_2H$

CM 5

CRN 25068-38-6
CMF (C15 H16 O2 . C3 H5 Cl O)x
CCI PMS

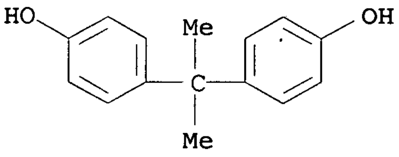
CM 6

CRN 106-89-8
CMF C3 H5 Cl O



CM 7

CRN 80-05-7
CMF C15 H16 O2



CC 37-6 (Plastics Manufacture and Processing)
ST vinyl ester epoxy thermosetting laminate glass fiber flame resistance; **flame retardant** shear strength flexural modulus delamination oxygen index
IT Epoxy resins, properties
(acrylates; effect of non-halogen **flame retardant** additives on vinyl ester resins and their composites)
IT Polyphosphoric acids
(ammonium salts, **fireproofing** agent; effect of non-halogen **flame retardant** additives on vinyl ester resins and their composites)
IT Delamination
Smoke
(d.; effect of non-halogen **flame retardant** additives on vinyl ester resins and their composites)
IT Bending strength
Fire-resistant materials
Fireproofing agents
Flammability
Flexural modulus
(effect of non-halogen **flame retardant**

additives on vinyl ester resins and their composites)

IT Laminated plastics, properties
(effect of non-halogen **flame retardant** additives on vinyl ester resins and their composites)

IT Glass fibers, uses
(effect of non-halogen **flame retardant** additives on vinyl ester resins and their composites)

IT Reinforced plastics
(glass fiber-reinforced, laminated; effect of non-halogen **flame retardant** additives on vinyl ester resins and their composites)

IT Shear strength
(inter-laminar; effect of non-halogen **flame retardant** additives on vinyl ester resins and their composites)

IT Oxygen index
(limiting; effect of non-halogen **flame retardant** additives on vinyl ester resins and their composites)

IT **81871-88-7 605619-33-8**
(effect of non-halogen **flame retardant** additives on vinyl ester resins and their composites)

IT 123-77-3, Azobiscarbonamide 839-90-7, Tris(2-hydroxyethyl)isocyanurate 36357-49-0, Tris(3-aminophenyl) **phosphine** oxide 153337-83-8, Aluminum trihydrate
(**fireproofing** agent; effect of non-halogen **flame retardant** additives on vinyl ester resins and their composites)

IT 288-32-4, Imidazole, uses
(polymerization catalyst; effect of non-halogen **flame retardant** additives on vinyl ester resins and their composites)

REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 11 OF 31 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2001:713495 HCAPLUS
DOCUMENT NUMBER: 135:257979
TITLE: **Flame retardant**, **flame-retardant** resin composition, molded object, and electronic part
INVENTOR(S): Taniguchi, Masatoshi; Tada, Yuji; Nishioka, Yoichi; Nakano, Shinji
PATENT ASSIGNEE(S): Otsuka Kagaku Kabushiki Kaisha, Japan
SOURCE: PCT Int. Appl., 53 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001070904	A1	20010927	WO 2001-JP2153	2001 0319

W: CN, ID, IN, KR, US

```
        RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU,
            MC, NL, PT, SE, TR
    JP 2001335703        A2    20011204    JP 2000-358220
                                                               2000
                                                               1124
    JP 3637277           B2    20050413
    EP 1279720           A1    20030129    EP 2001-912476
                                                               2001
                                                               0319
        R:  AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE,
            MC, PT, IE, FI, CY, TR
    US 2003166812        A1    20030904    US 2003-221806
                                                               2003
                                                               0414
PRIORITY APPLN. INFO.:                     JP 2000-78684      A
                                                               2000
                                                               0321

                                           JP 2000-358220     A
                                                               2000
                                                               1124

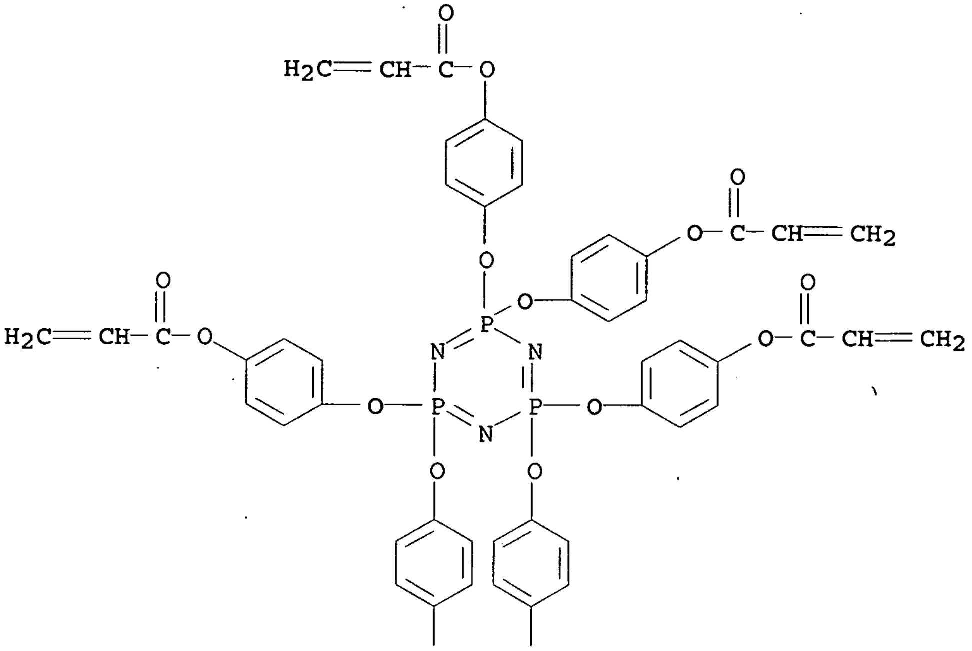
                                           WO 2001-JP2153     W
                                                               2001
                                                               0319

AB  A flame retardant which has excellent heat
    resistance and is less apt to cause juicing or a mold deposit
    during molding.  The flame retardant comprises
    polymer with structural units derived from ≥1 phosphazene
    compds. with per mol. containing ≥1 polymerizable functional
    group selected from vinyl, allyl, acryloyloxy, methacryloyloxy,
    acryloyl, and methacryloyl groups.
IT  361194-00-5P 361194-02-7P 361194-04-9P
       (flame retardant; flame-
       retardant epoxy resin/(poly)phosphazene compns. and
       electronic products wherewith)
RN  361194-00-5  HCAPLUS
CN  1,3,5,2,4,6-Triazatriphosphorine, 2,2,4,4,6,6-hexahydro-
    2,2,4,4,6,6-hexakis[4-[(1-oxo-2-propenyl)oxy]phenoxy]-,
    homopolymer (9CI)  (CA INDEX NAME)

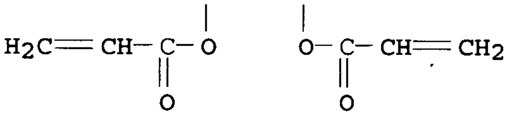
    CM   1

    CRN  361193-96-6
    CMF  C54 H42 N3 O18 P3
```

PAGE 1-A



PAGE 2-A



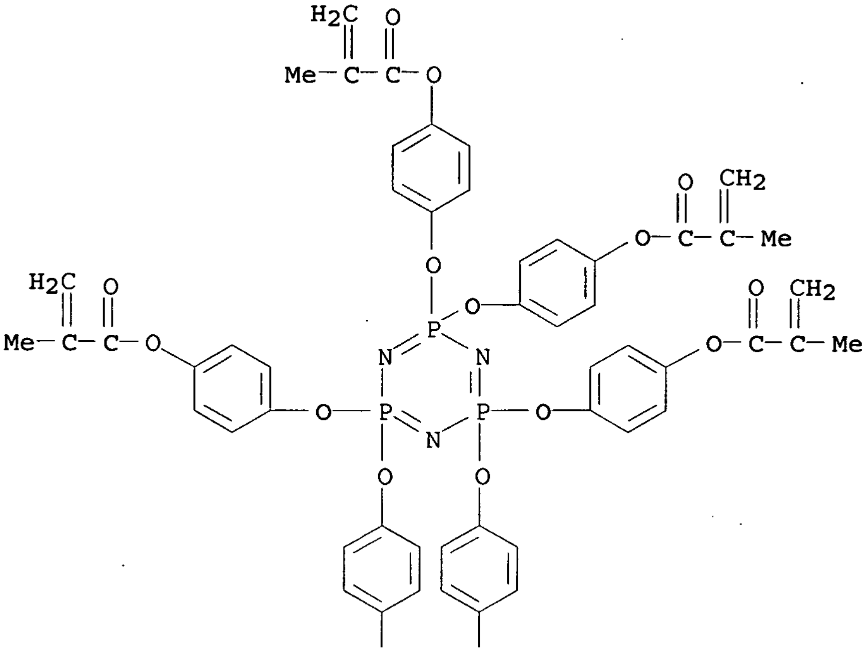
RN 361194-02-7 HCAPLUS

CN 1,3,5,2,4,6-Triazatriphosphorine, 2,2,4,4,6,6-hexahydro-2,2,4,4,6,6-hexakis[4-[(2-methyl-1-oxo-2-propenyl)oxy]phenoxy]-, polymer with ethenylbenzene (9CI) (CA INDEX NAME)

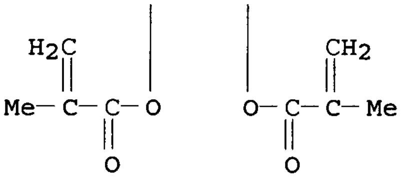
CM 1

CRN 361193-98-8
CMF C60 H54 N3 O18 P3

PAGE 1-A



PAGE 2-A



CM 2

CRN 100-42-5
CMF C8 H8

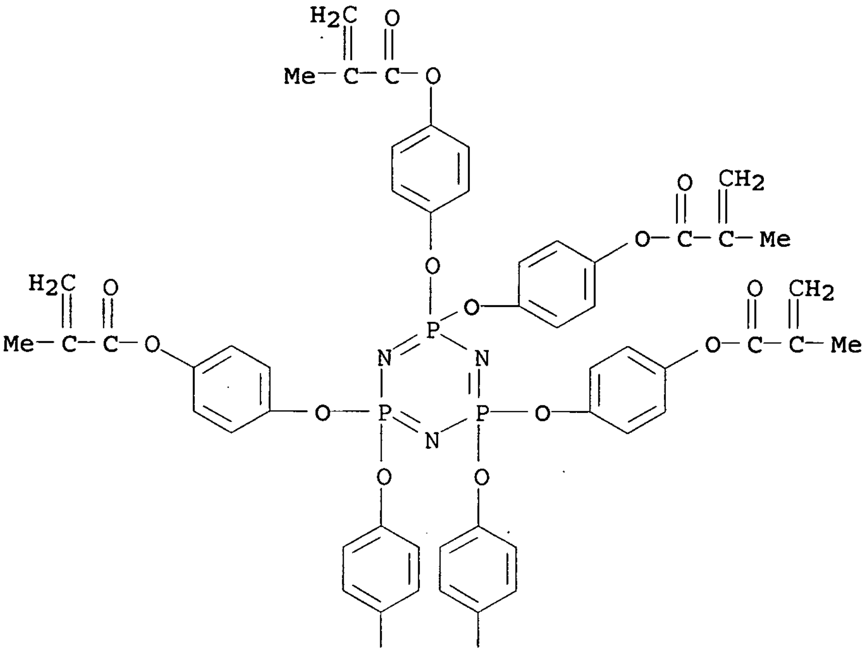
$H_2C{=}CH-Ph$

RN 361194-04-9 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, methyl ester, polymer with 2,2,4,4,6,6-hexahydro-2,2,4,4,6,6-hexakis[4-[(2-methyl-1-oxo-2-propenyl)oxy]phenoxy]-1,3,5,2,4,6-triazatriphosphorine and 2,2,4,4,6,6-hexahydro-2,2,4,4,6,6-hexakis[4-[(1-oxo-2-propenyl)oxy]phenoxy]-1,3,5,2,4,6-triazatriphosphorine (9CI) (CA INDEX NAME)

CM 1

CRN 361193-98-8
CMF C60 H54 N3 O18 P3

PAGE 1-A



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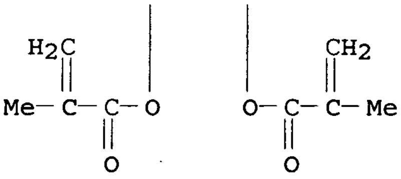
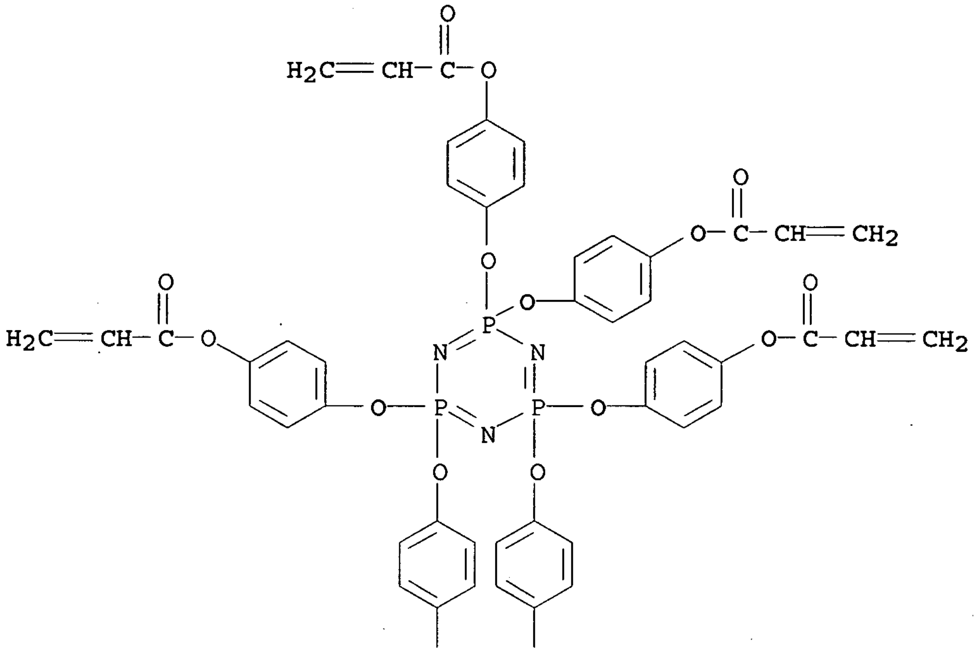


CM 2

CRN 361193-96-6
CMF C54 H42 N3 O18 P3

PAGE 1-A



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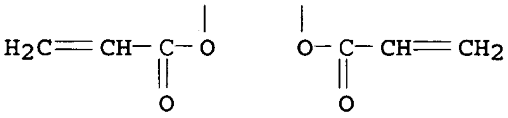
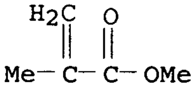


CM 3

CRN 80-62-6
CMF C5 H8 O2



IC ICM C09K021-14
ICS C08L101-00; C08L085-02; C08G079-02; C08G079-04; C08F030-02; C08F290-06; C08F290-14; C08F299-02
CC 37-6 (Plastics Manufacture and Processing)
Section cross-reference(s): 38, 76
ST **flame retardant** phosphazene epoxy resin polycarbonate electronic; phosphazene **flame retardant** vinyl allyl acryloyloxy methacryloyloxy acryloyl methacryloyl
IT Fluoropolymers, properties

```
        (G 307; flame-retardant epoxy
        resin/(poly)phosphazene compns. and electronic products
        wherewith)
IT   Polycarbonates, properties
        (aromatic; flame-retardant epoxy
        resin/(poly)phosphazene compns. and electronic products
        wherewith)
IT   Fire-resistant materials
       Fireproofing agents
        (flame-retardant epoxy
        resin/(poly)phosphazene compns. and electronic products
        wherewith)
IT   Phosphazenes
        (flame-retardant epoxy
        resin/(poly)phosphazene compns. and electronic products
        wherewith)
IT   Polyoxyphenylenes
        (flame-retardant epoxy
        resin/(poly)phosphazene compns. and electronic products
        wherewith)
IT   Epoxy resins, properties
        (phenolic, novolak; flame-retardant epoxy
        resin/(poly)phosphazene compns. and electronic products
        wherewith)
IT   9002-84-0, G 307
        (G 307; flame-retardant epoxy
        resin/(poly)phosphazene compns. and electronic products
        wherewith)
IT   108-95-2DP, Phenol, reaction products with
     hexachlorocyclotriphosphazene and 4-methoxyphenol, reaction
     products with (meth)acryloyl chloride, polymers, preparation
     150-76-5DP, 4-Methoxyphenol, reaction products with
     hexachlorocyclotriphosphazene and phenol, reaction products with
     (meth)acryloyl chloride, polymers   814-68-6DP, Acryloyl chloride,
     reaction products with hexachlorocyclotriphosphazene reaction
     products with 4-methoxyphenol and phenol, polymers   920-46-7DP,
     Methacryloyl chloride, reaction products with
     hexachlorocyclotriphosphazene reaction products with
     4-methoxyphenol and phenol, polymers 361194-00-5P
     361194-02-7P 361194-04-9P
        (flame retardant; flame-
        retardant epoxy resin/(poly)phosphazene compns. and
        electronic products wherewith)
IT   992-79-0P
        (flame retardant; flame-
        retardant epoxy resin/(poly)phosphazene compns. and
        electronic products wherewith)
IT   940-71-6DP, reaction products with phenol and/or 4-methoxyphenol,
     reaction products with (meth)acryloyl chloride, polymers
        (flame-retardant epoxy
        resin/(poly)phosphazene compns. and electronic products
        wherewith)
IT   940-71-6P   2950-45-0P   4349-18-2P   23744-66-3P   23788-22-9P
     361193-96-6P   361193-98-8P
        (flame-retardant epoxy
        resin/(poly)phosphazene compns. and electronic products
        wherewith)
IT   106677-58-1, Santac UT 61   223482-46-0, Iupilon S 2000N
     223483-22-5, Xyron X 9108
        (flame-retardant epoxy
        resin/(poly)phosphazene compns. and electronic products
        wherewith)
IT    108-95-2, Phenol, reactions   150-76-5, 4-Methoxyphenol
      814-68-6, Acryloyl chloride   920-46-7, Methacryloyl chloride
      1122-95-8   7719-12-2, Trichlorophosphine   7782-50-5,
      Chlorine, reactions   12125-02-9, Ammonium chloride, reactions
        (flame-retardant epoxy
        resin/(poly)phosphazene compns. and electronic products
        wherewith)
REFERENCE COUNT:          6     THERE ARE 6 CITED REFERENCES AVAILABLE
                                FOR THIS RECORD. ALL CITATIONS AVAILABLE
                                IN THE RE FORMAT

L34  ANSWER 12 OF 31  HCAPLUS  COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER:         2001:691925  HCAPLUS
DOCUMENT NUMBER:          135:243702
TITLE:                    Fireproofing method of fiber
                          materials with good feeling and washfastness
                          and fireproofing agents therefor
INVENTOR(S):              Yamashita, Takao; Hosoda, Masaaki; Miyazaki,
                          Koji
PATENT ASSIGNEE(S):       Nikka Chemical Industry Co., Ltd., Japan
SOURCE:                   Jpn. Kokai Tokkyo Koho, 6 pp.
                          CODEN: JKXXAF
DOCUMENT TYPE:            Patent
LANGUAGE:                 Japanese
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

    PATENT NO.          KIND   DATE       APPLICATION NO.        DATE
    ---------------     ----   --------   --------------------
    --------
    JP 2001254272        A2    20010921   JP 2000-65720
                                                                 2000
                                                                 0306
PRIORITY APPLN. INFO.:                    JP 2000-65720
                                                                 2000
                                                                 0306

OTHER SOURCE(S):          MARPAT 135:243702
AB    The method involves imparting acrylic phosphate compds. and
      phosphonate and/or phosphinate compds. onto fiber
      materials and undergoing electron beam irradiation  Preparing a solution
      containing di-Ph (2-acryloyloxyethyl) phosphate 20, di-Me phosphonate
      6, and DMF 74 parts, padding a polyester fabric with this solution
      (70% pickup), irradiating with electron beam, soaping 10 min at
      60° and drying 1 min at 120° gave a fabric with O
      index 25.4 and 25.0 initially and after washing 10 times resp.
IT    139099-98-2
        (fireproofing of fiber materials with good feeling
        and washfastness and fireproofing agents)
RN    139099-98-2  HCAPLUS
CN    2-Propenoic acid, 2-[(diphenoxyphosphinyl)oxy]ethyl ester,
      homopolymer (9CI)  (CA INDEX NAME)

      CM   1

      CRN  34419-55-1
      CMF  C17 H17 O6 P
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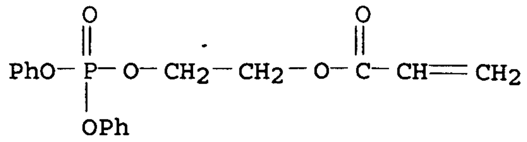


$$PhO-\underset{\underset{OPh}{|}}{\overset{\overset{O}{\|}}{P}}-O-CH_2-CH_2-O-\overset{\overset{O}{\|}}{C}-CH=CH_2$$

IC ICM D06M015-27
ICS C08F030-02; C09K021-12
CC 40-9 (Textiles and Fibers)
ST fiber material **fireproofing** agent;
diphenylacryloyloxyethyl phosphate dimethyl phosphonate textile **fireproofing** agent
IT Polyester fibers, properties
(fabrics; **fireproofing** of fiber materials with good feeling and washfastness and **fireproofing** agents)
IT Textiles
(fire-resistant; **fireproofing** of fiber materials with good feeling and washfastness and **fireproofing** agents)
IT Electron beams
Fireproofing agents
(**fireproofing** of fiber materials with good feeling and washfastness and **fireproofing** agents)
IT 762-04-9, Diethyl phosphonate 868-85-9, Dimethyl phosphonate
35948-25-5, 9,10-Dihydro-9-oxa-10-phosphaphenanthrene-10-oxide
51131-63-6 **139099-98-2**
(**fireproofing** of fiber materials with good feeling and washfastness and **fireproofing** agents)

L34 ANSWER 13 OF 31 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2001:531105 HCAPLUS
DOCUMENT NUMBER: 135:123514
TITLE: **Fireproofing** hot-melt adhesives, and manufacture of their adhesive films and circuit boards using them
INVENTOR(S): Saito, Kenji; Kumakura, Masayuki
PATENT ASSIGNEE(S): Sony Chemical Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001200214	A2	20010724	JP 2000-10623	2000 0119
PRIORITY APPLN. INFO.:			JP 2000-10623	2000 0119

AB The adhesives comprise base resins, **fireproofing** agents, photocurable resins, photoinitiators having maximum absorption spectrum (in the range of >310 nm) at <360 nm, and photoinitiators having maximum absorption spectrum (in the range of >360 nm) at <420 nm. Thus, an adhesive comprising a polyester (XA 0968), melamine-cyanuric acid compound (MC 610), melamine polyphosphate (MPP-A), calcium carbonate (Whiton SB), TiO2 (R 820), an acrylic polyester (Aronix M 6200), benzil di-Me ketal (Irgacure 651), and **bisacylphosphine** oxide (Irgacure 819) was applied on a plastic film and UV-irradiated to give an adhesive film showing adhesion strength 18 N/cm at room temperature and elec. resistivity 9.7 + 1012 Ω.

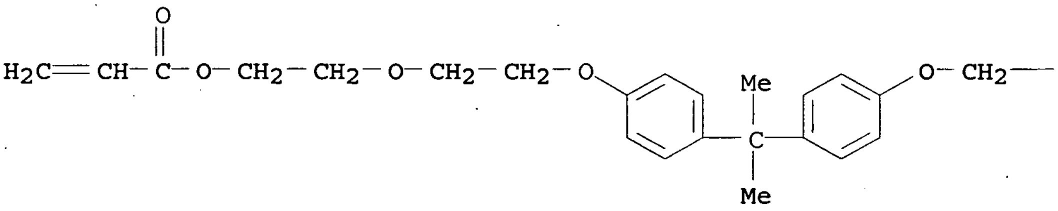
IT **60651-25-4P 117931-68-7P**
(**fireproofing** hot-melt adhesives containing photocurable resins for circuit board insulating adhesive films)

RN 60651-25-4 HCAPLUS
CN 2-Propenoic acid, (1-methylethylidene)bis(4,1-phenyleneoxy-2,1-ethanediyloxy-2,1-ethanediyl) ester, homopolymer (9CI) (CA INDEX NAME)

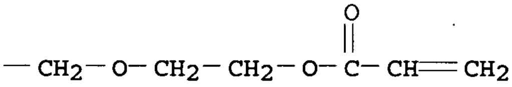
CM 1

CRN 56361-55-8
CMF C29 H36 O8

PAGE 1-A



PAGE 1-B

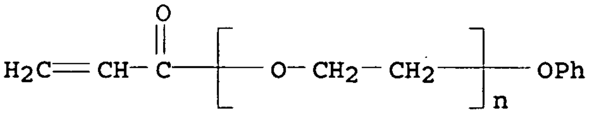


$-CH_2-O-CH_2-CH_2-O-\overset{O}{\overset{\|}{C}}-CH=CH_2$

RN 117931-68-7 HCAPLUS
CN Poly(oxy-1,2-ethanediyl), α-(1-oxo-2-propenyl)-ω-phenoxy-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 56641-05-5
CMF (C2 H4 O)n C9 H8 O2
CCI PMS



$H_2C=CH-\overset{O}{\overset{\|}{C}}-\left[O-CH_2-CH_2\right]_n-OPh$

IC ICM C09J004-06
ICS C09J167-00; H05K003-38

```
CC   38-3 (Plastics Fabrication and Uses)
     Section cross-reference(s): 76
ST   fireproofing adhesive film acrylic polyester; hot melt
     adhesive benzildimethyl ketal photoinitiator; circuit board
     insulator adhesive acylphosphine oxide
IT   Polyesters, uses
        (acrylic; fireproofing hot-melt adhesives containing
        photocurable resins for circuit board insulating adhesive
        films)
IT   Dielectric films
       Fireproofing agents
     Printed circuit boards
        (fireproofing hot-melt adhesives containing photocurable
        resins for circuit board insulating adhesive films)
IT   Polyesters, uses
        (fireproofing hot-melt adhesives containing photocurable
        resins for circuit board insulating adhesive films)
IT   Adhesive films
        (hot melt; fireproofing hot-melt adhesives containing
        photocurable resins for circuit board insulating adhesive
        films)
IT   Polymerization catalysts
        (photopolymn.; fireproofing hot-melt adhesives containing
        photocurable resins for circuit board insulating adhesive
        films)
IT   Acrylic polymers, uses
        (polyester-; fireproofing hot-melt adhesives containing
        photocurable resins for circuit board insulating adhesive
        films)
IT   471-34-1, Whiton SB, uses   13463-67-7, R 820, uses   37640-57-6,
     MC 610   41583-09-9, MPP-A
        (fireproofing agent; fireproofing hot-melt
        adhesives containing photocurable resins for circuit board
        insulating adhesive films)
IT   60651-25-4P 117931-68-7P   123504-05-2P, Aronix
     M 6200 homopolymer   350685-72-2P   350685-73-3P
        (fireproofing hot-melt adhesives containing photocurable
        resins for circuit board insulating adhesive films)
IT   350797-23-8, XA 0968
        (fireproofing hot-melt adhesives containing photocurable
        resins for circuit board insulating adhesive films)
IT   24650-42-8, Irgacure 651   162881-26-7, Irgacure 819
        (photoinitiator; fireproofing hot-melt adhesives
        containing photocurable resins for circuit board insulating
        adhesive films)

L34  ANSWER 14 OF 31  HCAPLUS  COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER:         2001:408056  HCAPLUS
DOCUMENT NUMBER:          135:20664
TITLE:                    Flame retardant additive
                          for radiation curable acrylic compositions
INVENTOR(S):              Fan, Mingxin; Ceska, Gary W.; Horgan, James
PATENT ASSIGNEE(S):       USA
SOURCE:                   U.S., 4 pp.
                          CODEN: USXXAM
DOCUMENT TYPE:            Patent
LANGUAGE:                 English
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:
```

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6242506	B1	20010605	US 1998-120508	19980722
PRIORITY APPLN. INFO.:			US 1998-120508	19980722

AB Radiation curable acrylic compns. are improved with regard to flame resistance by incorporating a reactive compound which is the reaction product of tetrabromophthalic anhydride or acid and a (meth)acrylic compound Thus, 4-methoxyphenol 0.75, tetrabromophthalic anhydride 463.7, and hydroxyethyl acrylate 174.0 g were stirred at 100°, exotherm was noticed (109°), 3.0 g **triphenylphosphine** was added at 100°, another exotherm was observed (112°), the mixture was stirred ta 100° for 5 h, 132.0 g butanediol diglycidyl ether was added, the mixture was stirred at 110° for 3 h to give a clear viscous resin showing acid value 2.43 mg KOH/g, epoxy value 0.45 mg KOH/g, color G 4.6, and viscosity 14,350 cps at 60°.

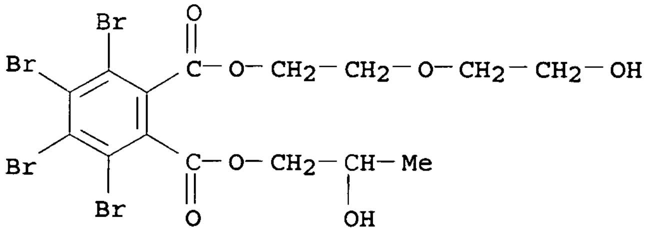
IT **342377-98-4DP**, reaction product with hydroxyethyl acrylate
(preparation of **flame retardant** additive for radiation curable acrylic compns.)

RN 342377-98-4 HCAPLUS

CN 1,2-Benzenedicarboxylic acid, 3,4,5,6-tetrabromo-, 2-(2-hydroxyethoxy)ethyl 2-hydroxypropyl ester, polymer with 1,6-hexanediyl di-2-propenoate, 5-isocyanato-1-(isocyanatomethyl)-1,3,3-trimethylcyclohexane and 4-methoxyphenol (9CI) (CA INDEX NAME)

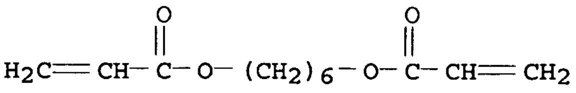
CM 1

CRN 20566-35-2
CMF C15 H16 Br4 O7



CM 2

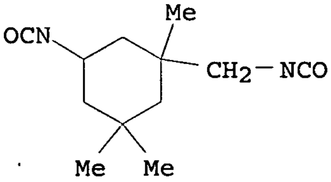
CRN 13048-33-4
CMF C12 H18 O4



$$H_2C{=}CH{-}\overset{O}{\overset{\|}{C}}{-}O{-}(CH_2)_6{-}O{-}\overset{O}{\overset{\|}{C}}{-}CH{=}CH_2$$

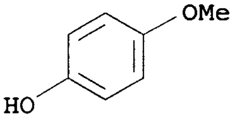
CM 3

CRN 4098-71-9
CMF C12 H18 N2 O2



CM 4

CRN 150-76-5
CMF C7 H8 O2



IC ICM C08G018-67
INCL 522093000
CC 38-3 (Plastics Fabrication and Uses)
ST **flame retardant** radiation curable acrylic
compn
IT Epoxy resins, uses
Polyurethanes, uses
(acrylates; preparation of **flame retardant**
additive for radiation curable acrylic compns.)
IT Fire-resistant materials
(preparation of **flame retardant** additive for
radiation curable acrylic compns.)
IT 818-61-1DP, reaction product with urethane 342377-97-3DP,
reaction product with hydroxyethyl acrylate **342377-98-4DP**
, reaction product with hydroxyethyl acrylate 342813-22-3P
(preparation of **flame retardant** additive for
radiation curable acrylic compns.)
REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE
FOR THIS RECORD. ALL CITATIONS AVAILABLE
IN THE RE FORMAT

L34 ANSWER 15 OF 31 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2001:407806 HCAPLUS
DOCUMENT NUMBER: 135:20432
TITLE: Manufacture of phosphorus-containing vinyl
esters and their use as **fireproofing**
agents for radical-polymerizable resin
compositions with good heat resistance
INVENTOR(S): Ogasawara, Kenji; Kimura, Hitoshi; Uno,
Yoshiki; Yamazaki, Takahide

PATENT ASSIGNEE(S): Matsushita Electric Works, Ltd., Japan; Nippon Shokubai Kagaku Kogyo Co., Ltd.
SOURCE: Jpn. Kokai Tokkyo Koho, 16 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001151855	A2	20010605	JP 1999-333541	1999 1125

PRIORITY APPLN. INFO.: JP 1999-333541 1999 1125

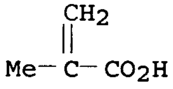
AB The compns. releasing no harmful gas when burned, useful for electronic laminate varnishes, etc., contain the reaction products of an epoxy resin, P compound and (meth)acrylic acid. Thus, heating a mixture of HCA-HQ (P compound) 162, Epo Tohto YDF 170 (bisphenol F-epichlorohydrin copolymer) 342 and styrene 189 at 70°, adding methacrylic acid 95 and hydroquinone 0.2, heating to 100°, adding **triphenylphosphine** catalyst 0.6 and styrene 68 g and heating until the acid number reaching below 15 mg-KOH/g gave a vinyl ester solution in styrene which was combined with Al hydroxide 257, Mg hydroxide 257 and Percumyl H 80 (cumyl hydroperoxide) 11 g to give a radical-polymerizable composition

IT **301170-28-5P 301170-33-2P 301170-45-6P**
301170-61-6P 343310-05-4P
(reactive **fireproofing** agents; manufacture of phosphorus-containing vinyl esters and use as **fireproofing** agents for radical-polymerizable resin compns. with good heat resistance)

RN 301170-28-5 HCAPLUS
CN 1,4-Benzenediol, 2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-, polymer with (chloromethyl)oxirane and methylenebis[phenol], 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 79-41-4
CMF C4 H6 O2

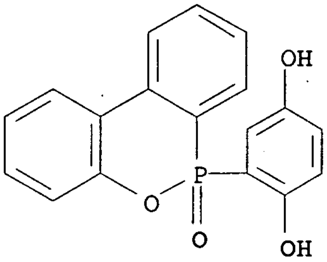

$Me-C(=CH_2)-CO_2H$

CM 2

CRN 301170-27-4
CMF (C18 H13 O4 P . C13 H12 O2 . C3 H5 Cl O)x
CCI PMS

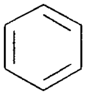
CM 3

CRN 99208-50-1
CMF C18 H13 O4 P



CM 4

CRN 1333-16-0
CMF C13 H12 O2
CCI IDS

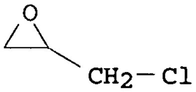


D1— OH

1/2 [D1— CH_2— D1]

CM 5

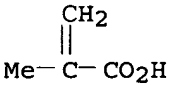
CRN 106-89-8
CMF C3 H5 Cl O



RN 301170-33-2 HCAPLUS
CN 1,4-Benzenediol, 2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-, polymer with (chloromethyl)oxirane and 4,4'-(1-methylethylidene)bis[phenol], 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 79-41-4
CMF C4 H6 O2

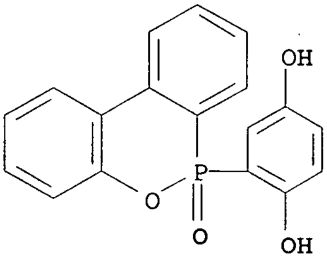


CM 2

CRN 301170-32-1
CMF (C18 H13 O4 P . C15 H16 O2 . C3 H5 Cl O)x
CCI PMS

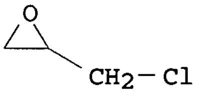
CM 3

CRN 99208-50-1
CMF C18 H13 O4 P



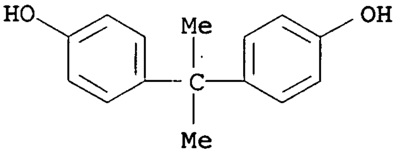
CM 4

CRN 106-89-8
CMF C3 H5 Cl O



CM 5

CRN 80-05-7
CMF C15 H16 O2

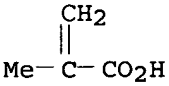


RN 301170-45-6 HCAPLUS
CN 1,4-Benzenediol, 2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-, polymer with (chloromethyl)oxirane, Epo Tohto YDCN 704P and

```
methylenebis[phenol], 2-methyl-2-propenoate (9CI)  (CA INDEX NAME)

CM   1

CRN  79-41-4
CMF  C4 H6 O2
```



$$\mathrm{Me{-}\overset{\overset{\displaystyle CH_2}{\|}}{C}{-}CO_2H}$$

```
CM   2

CRN  301170-44-5
CMF  (C18 H13 O4 P . C13 H12 O2 . C3 H5 Cl O . Unspecified)x
CCI  PMS

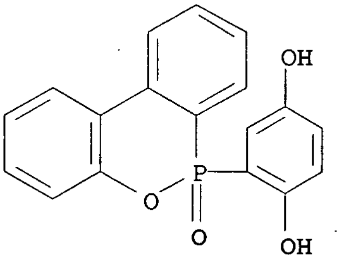
     CM   3

     CRN  161544-94-1
     CMF  Unspecified
     CCI  PMS, MAN

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

     CM   4

     CRN  99208-50-1
     CMF  C18 H13 O4 P
```



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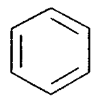
     CM   5

     CRN  1333-16-0
     CMF  C13 H12 O2
     CCI  IDS
```

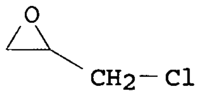


D1—OH

1/2 [D1—CH_2—D1]

CM 6

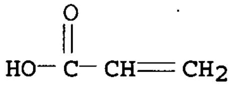
CRN 106-89-8
CMF C3 H5 Cl O



RN 301170-61-6 HCAPLUS
CN 1,4-Benzenediol, 2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-, polymer with (chloromethyl)oxirane and methylenebis[phenol], 2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 79-10-7
CMF C3 H4 O2



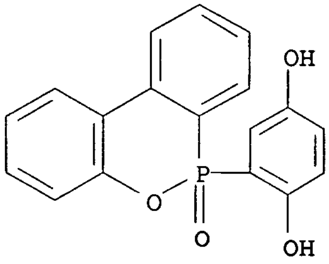
$HO-\overset{O}{\overset{\|}{C}}-CH=CH_2$

CM 2

CRN 301170-27-4
CMF (C18 H13 O4 P . C13 H12 O2 . C3 H5 Cl O)x
CCI PMS

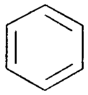
CM 3

CRN 99208-50-1
CMF C18 H13 O4 P



CM 4

CRN 1333-16-0
CMF C13 H12 O2
CCI IDS

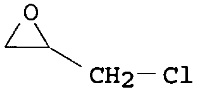


D1— OH

1/2 [D1— CH_2— D1]

CM 5

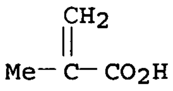
CRN 106-89-8
CMF C3 H5 Cl O



RN 343310-05-4 HCAPLUS
CN 1,4-Benzenediol, 2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-, polymer with Epo Tohto YDPN 638P, 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 79-41-4
CMF C4 H6 O2



$\mathrm{Me{-}\overset{\overset{\displaystyle CH_2}{\|}}{C}{-}CO_2H}$

CM 2

CRN 343310-04-3
CMF (C18 H13 O4 P . Unspecified)x
CCI PMS

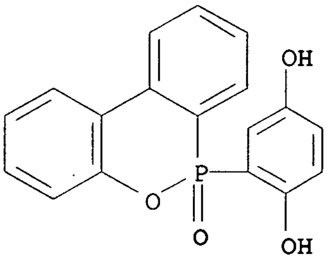
CM 3

CRN 121088-80-0
CMF Unspecified
CCI PMS, MAN

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CM 4

CRN 99208-50-1
CMF C18 H13 O4 P



IC ICM C08G059-17
ICS C08F002-44; C08F290-06; C08K003-22; C08K005-521; C08L055-00
CC 37-6 (Plastics Manufacture and Processing)
Section cross-reference(s): 38
ST dihydroxyphenyl **phosphinate** epoxy resin vinyl ester **fireproofing** agent; radical polymn reactive phosphorus contg epoxy resin methacrylate ester
IT Phenolic resins, preparation
(epoxy, novolak, acrylates, P-containing as reactive **fireproofing** agents; manufacture of phosphorus-containing vinyl esters and use as **fireproofing** agents for radical-polymerizable resin compns. with good heat resistance)
IT Heat-resistant materials
(manufacture of phosphorus-containing vinyl esters and use as **fireproofing** agents for radical-polymerizable resin compns. with good heat resistance)
IT Epoxy resins, preparation
(methacrylates, P-containing as reactive **fireproofing** agents; manufacture of phosphorus-containing vinyl esters and use as **fireproofing** agents for radical-polymerizable resin compns. with good heat resistance)
IT Epoxy resins, preparation

```
        (phenolic, novolak, acrylates, P-containing as reactive
        fireproofing agents; manufacture of phosphorus-containing vinyl
        esters and use as fireproofing agents for
        radical-polymerizable resin compns. with good heat resistance)
IT   Polymerization
        (radical; manufacture of phosphorus-containing vinyl esters and use as
        fireproofing agents for radical-polymerizable resin
        compns. with good heat resistance)
IT   Fireproofing agents
        (reactive; manufacture of phosphorus-containing vinyl esters and use as
        fireproofing agents for radical-polymerizable resin
        compns. with good heat resistance)
IT   Printed circuit boards
        (vanish for manuf; manufacture of phosphorus-containing vinyl esters and
        use as fireproofing agents for radical-polymerizable
        resin compns. with good heat resistance)
IT   100-42-5, Styrene, uses
        (composition with polymeric fireproofing agents; manufacture of
        phosphorus-containing vinyl esters and use as fireproofing
        agents for radical-polymerizable resin compns. with good heat
        resistance)
IT   1309-42-8, Magnesium hydroxide   21645-51-2, Aluminum hydroxide,
     uses
        (fire retardants; manufacture of phosphorus-containing vinyl esters and
        use as fireproofing agents for radical-polymerizable
        resin compns. with good heat resistance)
IT   760973-57-7, PX 110
        (fireproofing co-agent; manufacture of phosphorus-containing
        vinyl esters and use as fireproofing agents for
        radical-polymerizable resin compns. with good heat resistance)
IT   301170-28-5P 301170-33-2P 301170-45-6P
     301170-61-6P   343255-01-6P 343310-05-4P
     343310-07-6P
        (reactive fireproofing agents; manufacture of
        phosphorus-containing vinyl esters and use as fireproofing
        agents for radical-polymerizable resin compns. with good heat
        resistance)

L34  ANSWER 16 OF 31  HCAPLUS  COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER:         2001:21370  HCAPLUS
DOCUMENT NUMBER:          134:86998
TITLE:                    Flame-retardant
                          P-containing unsaturated polyesters, their
                          compositions, preparation of acids for the
                          polyesters, and their use
INVENTOR(S):              Okumura, Hiroya; Uchida, Toshiaki; Takeuchi,
                          Hiroshi
PATENT ASSIGNEE(S):       Takeda Chemical Industries, Ltd., Japan
SOURCE:                   Jpn. Kokai Tokkyo Koho, 8 pp.
                          CODEN: JKXXAF
DOCUMENT TYPE:            Patent
LANGUAGE:                 Japanese
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.          KIND   DATE       APPLICATION NO.        DATE
     ---------------     ----   --------   --------------------
     --------
     JP 2001002769        A2    20010109   JP 1999-179204
                                                                  1999
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0625

PRIORITY APPLN. INFO.: JP 1999-179204
1999
0625

OTHER SOURCE(S): MARPAT 134:86998

AB The unsatd. polyesters with P content 0.2-10% employ as acids C2-20 carboxyacyl diesters of 10-dihydroxynaphthyl- or 10-dihydroxyphenyl-9,10-dihydro-9-oxa-10-phosphaphenanthrene 10-oxide (I) and/or **diphenylphosphinylbenzenediol.** The compns. contain the polyesters and reactive diluents bearing C:C and optionally 1-30% (on the polyesters) rubbers. The compns. are further compounded with hardeners and fillers 0.1-5 and 0-400% to 100% of the compns., resp., impregnated into fiber reinforcements, laminated, and cladded with Cu foils. Thus, I (OH on 2' and 5') 437, itaconic anhydride 146, and succinic anhydride 225 g were reacted at 120° in the presence of Zn(OAc)2 then condensed with fumaric acid 130, propylene glycol 171, and dipropylene glycol 120 g at 210° to yield 1102 g of a P-containing unsatd. polyester with acid value 26.9 mg-KOH/g, which was diluted with 735 g styrene to give a composition It was compounded with 1.25% of a cumene hydroperoxide (Percumyl H 80) and 150% Al(OH)3 (CL 310), cast to give thick plates, and cured at 100° then 175° to give test pieces having Tg 150.0°, UL 94 flame retardance V-0, and good solder resistance before and after pressure cooker treatment (121°, 95% RH, 1 h).

IT **316810-44-3P 316810-45-4P 316810-47-6P**
(crosslinked; preparation of P-containing polycarboxylic acids for **flame-retardant** unsatd. polyesters, their compns., and their Cu clad laminates)

RN 316810-44-3 HCAPLUS

CN Butanedioic acid, methylene-, ester with 2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-1,4-butanediol hydrogen butanedioate, polymer with (2E)-2-butenedioic acid, ethenylbenzene, oxybis[propanol] and 1,2-propanediol (9CI) (CA INDEX NAME)

CM 1

CRN 25265-71-8
CMF C6 H14 O3
CCI IDS

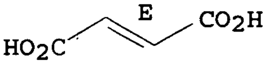
$HO-CH_2-CH_2-O-CH_2-CH_2-OH$

2 (D1—Me)

CM 2

CRN 110-17-8
CMF C4 H4 O4

Double bond geometry as shown.



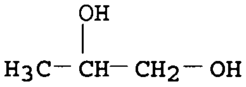
CM 3

CRN 100-42-5
CMF C8 H8

$H_2C{=}CH-Ph$

CM 4

CRN 57-55-6
CMF C3 H8 O2

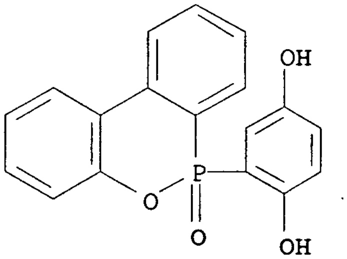

$H_3C-CH(OH)-CH_2-OH$

CM 5

CRN 316810-42-1
CMF C18 H13 O4 P . x C5 H6 O4 . x C4 H6 O4

CM 6

CRN 99208-50-1
CMF C18 H13 O4 P



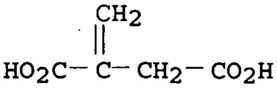
CM 7

CRN 110-15-6
CMF C4 H6 O4

$HO_2C-CH_2-CH_2-CO_2H$

CM 8

CRN 97-65-4
CMF C5 H6 O4



$$HO_2C-\overset{\overset{\Large CH_2}{\|}}{C}-CH_2-CO_2H$$

RN 316810-45-4 HCAPLUS
CN Butanedioic acid, methylene-, ester with 2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-1,4-benzenediol hydrogen (2Z)-2-butenedioate, polymer with (2E)-2-butenedioic acid, ethenylbenzene, 2,2'-oxybis[ethanol] and 1,2-propanediol (9CI) (CA INDEX NAME)

CM 1

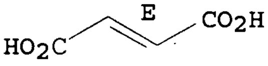
CRN 111-46-6
CMF C4 H10 O3

$HO-CH_2-CH_2-O-CH_2-CH_2-OH$

CM 2

CRN 110-17-8
CMF C4 H4 O4

Double bond geometry as shown.



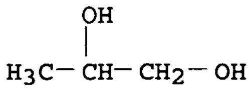
CM 3

CRN 100-42-5
CMF C8 H8

$H_2C=CH-Ph$

CM 4

CRN 57-55-6
CMF C3 H8 O2



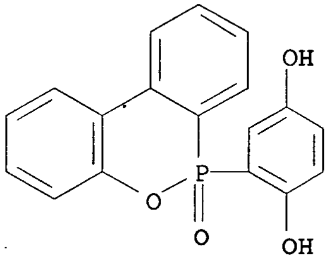
$$H_3C-\overset{\overset{\displaystyle OH}{|}}{CH}-CH_2-OH$$

CM 5

CRN 316810-43-2
CMF C18 H13 O4 P . x C4 H6 O4 . x C4 H4 O4

CM 6

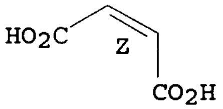
CRN 99208-50-1
CMF C18 H13 O4 P



CM 7

CRN 110-16-7
CMF C4 H4 O4

Double bond geometry as shown.



CM 8

CRN 110-15-6
CMF C4 H6 O4

$HO_2C-CH_2-CH_2-CO_2H$

RN 316810-47-6 HCAPLUS
CN Butanedioic acid, methylene-, ester with 2-(diphenylphosphinyl)-
1,4-benzenediol hydrogen butanedioate, polymer with
(2E)-2-butenedioic acid, ethenylbenzene, oxybis[propanol] and
1,2-propanediol (9CI) (CA INDEX NAME)

CM 1

CRN 25265-71-8
CMF C6 H14 O3
CCI IDS

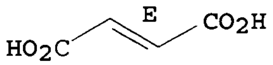
$HO-CH_2-CH_2-O-CH_2-CH_2-OH$

2 (D1-Me)

CM 2

CRN 110-17-8
CMF C4 H4 O4

Double bond geometry as shown.



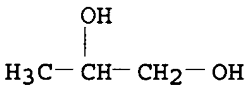
CM 3

CRN 100-42-5
CMF C8 H8

$H_2C=CH-Ph$

CM 4

CRN 57-55-6
CMF C3 H8 O2



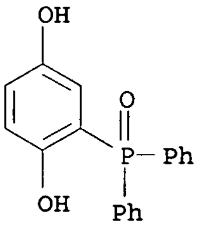
$$H_3C-\underset{}{\overset{OH}{\overset{|}{CH}}}-CH_2-OH$$

CM 5

CRN 316810-46-5
CMF C18 H15 O3 P . x C5 H6 O4 . x C4 H6 O4

CM 6

CRN 13291-46-8
CMF C18 H15 O3 P



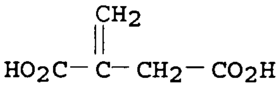
CM 7

CRN 110-15-6
CMF C4 H6 O4

$HO_2C-CH_2-CH_2-CO_2H$

CM 8

CRN 97-65-4
CMF C5 H6 O4


$HO_2C-C(=CH_2)-CH_2-CO_2H$

IC ICM C08G063-692
ICS C08F283-01; C08J005-24; C08K003-00; C08L021-00; C08L067-06;
C09K021-12; C09K021-14
CC 37-6 (Plastics Manufacture and Processing)
Section cross-reference(s): 38, 76
ST unsatd polyester flame retardance halogen free; phosphorus contg
polycarboxylic acid unsatd polyester; phosphaphenanthrene oxide
carboxyacyl ester unsatd polyester; copper clad laminate unsatd
polyester phosphorus; **phenylphosphinylbenzenediol**
carboxyacyl ester unsatd polyester.
IT Fire-resistant materials
Printed circuit boards
(preparation of P-containing polycarboxylic acids for **flame-retardant** unsatd. polyesters, their compns., and their
Cu clad laminates)
IT Laminated plastics, properties
(preparation of P-containing polycarboxylic acids for **flame-retardant** unsatd. polyesters, their compns., and their
Cu clad laminates)
IT Polyesters, preparation
(unsatd., styrene-crosslinked; preparation of P-containing
polycarboxylic acids for **flame-retardant**
unsatd. polyesters, their compns., and their Cu clad laminates)
IT **316810-44-3P 316810-45-4P 316810-47-6P**
(crosslinked; preparation of P-containing polycarboxylic acids for
flame-retardant unsatd. polyesters, their
compns., and their Cu clad laminates)

IT 80-15-9, Percumyl H 80
(crosslinking catalysts; preparation of P-containing polycarboxylic acids for **flame-retardant** unsatd. polyesters, their compns., and their Cu clad laminates)

IT 21645-51-2, CL 310, uses
(fillers; preparation of P-containing polycarboxylic acids for **flame-retardant** unsatd. polyesters, their compns., and their Cu clad laminates)

IT 316810-42-1P 316810-43-2P 316810-46-5P
(preparation of P-containing polycarboxylic acids for **flame-retardant** unsatd. polyesters, their compns., and their Cu clad laminates)

L34 ANSWER 17 OF 31 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2001:18996 HCAPLUS
DOCUMENT NUMBER: 134:86996
TITLE: **Flame-retardant** unsaturated polyesters and their manufacture, compositions, and copper clad laminates
INVENTOR(S): Okumura, Hiroya; Uchida, Toshiaki; Takeuchi, Hiroshi
PATENT ASSIGNEE(S): Takeda Chemical Industries, Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001002770	A2	20010109	JP 1999-179205	19990625
PRIORITY APPLN. INFO.:			JP 1999-179205	19990625

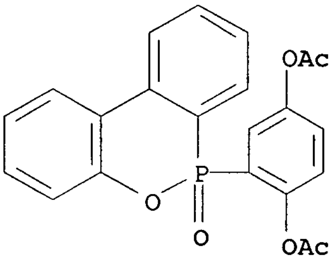
OTHER SOURCE(S): MARPAT 134:86996

AB The unsatd. polyesters with P content 0.2-10% are prepared by reacting (a) lower fatty acid anhydride derivs. of 10-dihydroxynaphthyl- or 10-dihydroxyphenyl-9,10-dihydro-9-oxa-10-phosphaphenanthrene 10-oxide (I) and/or **diphenylphosphinylbenzenediol** or their mixts. with diols and (b) α,β-olefinic unsatd. dicarboxylic acids or their mixts. with other dicarboxylic acids. Thus, 324 g I (OH on 2' and 5') was reacted with 1530 g Ac2O, 492.4 g of the obtained acetylated I was esterified with fumaric acid 100.0, isophthalic acid 200.3, and itaconic acid 112.1 g in the presence of dibutyltin maleate, then condensed with maleic anhydride 50.7, diethylene glycol 54.8, propylene glycol 78.6, and dipropylene glycol 92.4 g at 210° to yield 933.5 g of a P-containing unsatd. polyester with acid value 31.9 mg-KOH/g, which was diluted with 622 g styrene to give a composition It was compounded with 1.25% of a cumene hydroperoxide (Percumyl H 80) and 150% Al(OH)3 (CL 310), cast to give thick plates, and cured at 100° then 175° to give test pieces having Tg 160.0°, UL 94 flame retardance V-0, and good solder resistance before and after pressure cooker treatment (121°, 95% RH, 1 h).

IT **316810-97-6P 316811-03-7P**
(crosslinked; preparation of P-containing diol derivs. for **flame-retardant** unsatd. polyesters, their compns., and their Cu clad laminates)
RN 316810-97-6 HCAPLUS
CN 1,3-Benzenedicarboxylic acid, polymer with (2E)-2-butenedioic acid, ethenylbenzene, 2,5-furandione, methylenebutanedioic acid, 2-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)-1,4-phenylene diacetate, 2,2'-oxybis[ethanol], oxybis[propanol] and 1,2-propanediol (9CI) (CA INDEX NAME)

CM 1

CRN 101842-63-1
CMF C22 H17 O6 P



CM 2

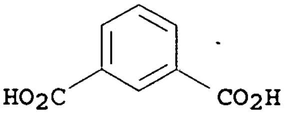
CRN 25265-71-8
CMF C6 H14 O3
CCI IDS

$HO-CH_2-CH_2-O-CH_2-CH_2-OH$

2 (D1— Me)

CM 3

CRN 121-91-5
CMF C8 H6 O4



CM 4

CRN 111-46-6

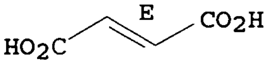
CMF C4 H10 O3

$HO-CH_2-CH_2-O-CH_2-CH_2-OH$

CM 5

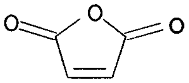
CRN 110-17-8
CMF C4 H4 O4

Double bond geometry as shown.



CM 6

CRN 108-31-6
CMF C4 H2 O3



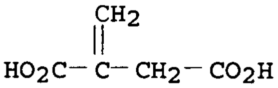
CM 7

CRN 100-42-5
CMF C8 H8

$H_2C{=}CH-Ph$

CM 8

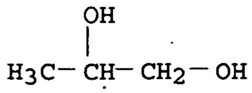
CRN 97-65-4
CMF C5 H6 O4



$HO_2C-C(=CH_2)-CH_2-CO_2H$

CM 9

CRN 57-55-6
CMF C3 H8 O2

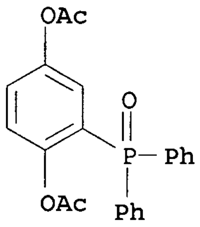


$H_3C-CH(OH)-CH_2-OH$

RN 316811-03-7 HCAPLUS
CN 1,3-Benzenedicarboxylic acid, polymer with (2E)-2-butenedioic acid, 2-(diphenylphosphinyl)-1,4-phenylene diacetate, ethenylbenzene, 2,5-furandione, methylenebutanedioic acid, oxybis[propanol] and 1,2-propanediol (9CI) (CA INDEX NAME)

CM 1

CRN 120303-82-4
CMF C22 H19 O5 P



CM 2

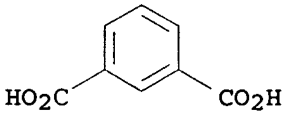
CRN 25265-71-8
CMF C6 H14 O3
CCI IDS

$HO-CH_2-CH_2-O-CH_2-CH_2-OH$

2 (D1- Me)

CM 3

CRN 121-91-5
CMF C8 H6 O4

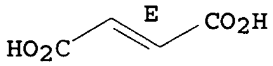


CM 4

CRN 110-17-8

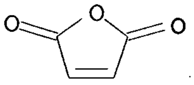
CMF C4 H4 O4

Double bond geometry as shown.



CM 5

CRN 108-31-6
CMF C4 H2 O3



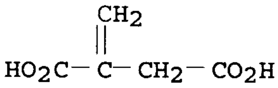
CM 6

CRN 100-42-5
CMF C8 H8

$H_2C{=}CH-Ph$

CM 7

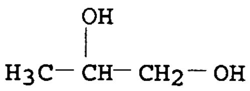
CRN 97-65-4
CMF C5 H6 O4



$HO_2C-C(=CH_2)-CH_2-CO_2H$

CM 8

CRN 57-55-6
CMF C3 H8 O2



$H_3C-CH(OH)-CH_2-OH$

IC ICM C08G063-692
ICS C08L067-00
CC 37-6 (Plastics Manufacture and Processing)
Section cross-reference(s): 38, 76
ST unsatd polyester flame retardance halogen free;
phosphaphenanthrene oxide carboxyacyl ester unsatd polyester;

copper clad laminate unsatd polyester phosphorus;
phenylphosphinylbenzenediol carboxyacyl ester unsatd
polyester

IT Fire-resistant materials
Printed circuit boards
(preparation of P-containing diol derivs. for **flame-retardant** unsatd. polyesters, their compns., and their Cu clad laminates)

IT Laminated plastics, properties
(preparation of P-containing diol derivs. for **flame-retardant** unsatd. polyesters, their compns., and their Cu clad laminates)

IT Polyesters, preparation
(unsatd., styrene-crosslinked; preparation of P-containing diol derivs. for **flame-retardant** unsatd. polyesters, their compns., and their Cu clad laminates)

IT **316810-97-6P** 316810-99-8P **316811-03-7P**
(crosslinked; preparation of P-containing diol derivs. for **flame-retardant** unsatd. polyesters, their compns., and their Cu clad laminates)

IT 80-15-9, Percumyl H 80
(crosslinking catalysts; preparation of P-containing diol derivs. for **flame-retardant** unsatd. polyesters, their compns., and their Cu clad laminates)

IT 21645-51-2, CL 310, uses
(fillers; preparation of P-containing diol derivs. for **flame-retardant** unsatd. polyesters, their compns., and their Cu clad laminates)

IT 101842-63-1P 120303-82-4P 316810-95-4P
(preparation of P-containing diol derivs. for **flame-retardant** unsatd. polyesters, their compns., and their Cu clad laminates)

IT 13291-46-8 99208-50-1, 10-(2',5'-Dihydroxyphenyl)-9,10-dihydro-9-oxa-10-phosphaphenanthrene 10-oxide 118406-06-7
(preparation of P-containing diol derivs. for **flame-retardant** unsatd. polyesters, their compns., and their Cu clad laminates)

IT 108-24-7, Acetic anhydride
(reaction with diols; preparation of P-containing diol derivs. for **flame-retardant** unsatd. polyesters, their compns., and their Cu clad laminates)

L34 ANSWER 18 OF 31 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER:	2000:778491 HCAPLUS
DOCUMENT NUMBER:	133:336037
TITLE:	Polyurethane (meth)acrylate-type compositions for **flame-retardant** molding materials and moldings thereof
INVENTOR(S):	Yamazaki, Isahide
PATENT ASSIGNEE(S):	Nippon Shokubai Kagaku Kogyo Co., Ltd., Japan
SOURCE:	Jpn. Kokai Tokkyo Koho, 10 pp. CODEN: JKXXAF
DOCUMENT TYPE:	Patent
LANGUAGE:	Japanese
FAMILY ACC. NUM. COUNT:	1
PATENT INFORMATION:	

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

JP 2000309701 A2 20001107 JP 1999-120189 19990427

PRIORITY APPLN. INFO.: JP 1999-120189 19990427

AB The compns. contain (a) polyurethane (meth)acrylates prepared by reacting polyhydric alcs. containing P-containing polyhydric alcs., polyfunctional isocyanates, and OH-containing (meth)acrylates and/or phosphoric acid group-containing (meth)acrylates, (b) polymerizable unsatd. monomers, and (c) inorg. fillers. Thus, 206 parts tris(3-hydroxypropyl)**phosphine** oxide and 359 parts hydroxyethyl methacrylate were urethanated with 481 parts TDI in the presence of dibutyltin dilaurate to give a polyurethane methacrylate, 700 parts of which was mixed with 300 parts styrene and 1500 parts Al(OH)3 (Higilite H 32I) to give a composition It (100 parts) was mixed with 0.4 parts Perbutyl Z to give a molding material. Its molding exhibited O index 45 and good water resistance.

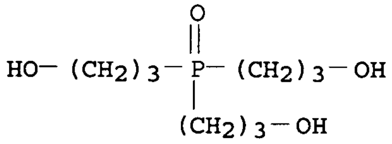
IT **303953-57-3P 303953-58-4P**
(P-containing polyurethane (meth)acrylate compns. for **flame-retardant**, water-resistant molding materials)

RN 303953-57-3 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2-(phosphonooxy)ethyl ester, polymer with 1,3-diisocyanatomethylbenzene, ethenylbenzene, α,α'-[(1-methylethylidene)di-4,1-phenylene]bis[ω-hydroxypoly[oxy(methyl-1,2-ethanediyl)]] and 3,3',3''-phosphinylidynetris[1-propanol] (9CI) (CA INDEX NAME)

CM 1

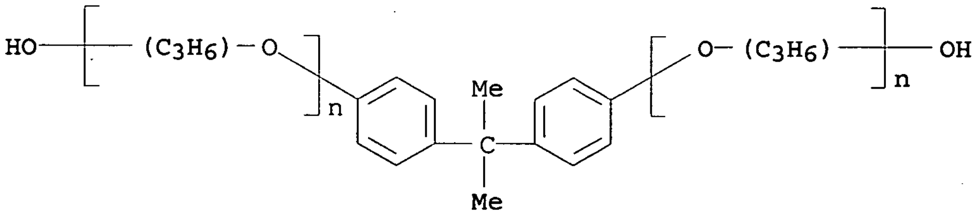
CRN 51805-42-6
CMF C9 H21 O4 P



$HO-(CH_2)_3-P(=O)(-(CH_2)_3-OH)-(CH_2)_3-OH$

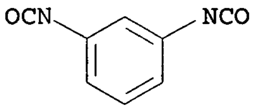
CM 2

CRN 37353-75-6
CMF (C3 H6 O)n (C3 H6 O)n C15 H16 O2
CCI IDS, PMS



```
     CM   3

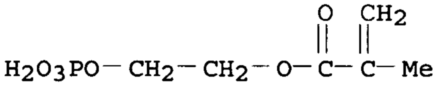
     CRN  26471-62-5
     CMF  C9 H6 N2 O2
     CCI  IDS
```



D1—Me

```
     CM   4

     CRN  24599-21-1
     CMF  C6 H11 O6 P
```



$H_2O_3PO-CH_2-CH_2-O-\overset{\overset{O}{||}}{C}-\overset{\overset{CH_2}{||}}{C}-Me$

```
     CM   5

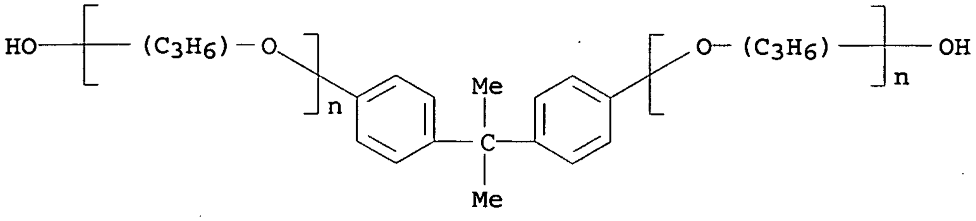
     CRN  100-42-5
     CMF  C8 H8
```

$H_2C{=}CH-Ph$

```
RN   303953-58-4  HCAPLUS
CN   2-Propenoic acid, 2-methyl-, 2-hydroxyethyl ester, polymer with
     1,3-diisocyanatomethylbenzene, ethenylbenzene,
     α,α'-[(1-methylethylidene)di-4,1-phenylene]bis[ω-
     hydroxypoly[oxy(methyl-1,2-ethanediyl)]] and 2-(phosphonooxy)ethyl
     2-methyl-2-propenoate (9CI)  (CA INDEX NAME)

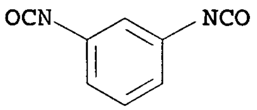
     CM   1

     CRN  37353-75-6
     CMF  (C3 H6 O)n (C3 H6 O)n C15 H16 O2
     CCI  IDS, PMS
```



CM 2

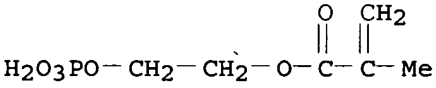
CRN 26471-62-5
CMF C9 H6 N2 O2
CCI IDS



D1— Me

CM 3

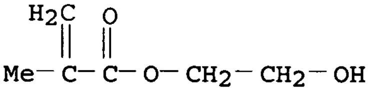
CRN 24599-21-1
CMF C6 H11 O6 P



$H_2O_3PO-CH_2-CH_2-O-\overset{O}{\overset{\|}{C}}-\overset{CH_2}{\overset{\|}{C}}-Me$

CM 4

CRN 868-77-9
CMF C6 H10 O3



$Me-\overset{H_2C}{\overset{\|}{C}}-\overset{O}{\overset{\|}{C}}-O-CH_2-CH_2-OH$

CM 5

CRN 100-42-5
CMF C8 H8

$H_2C{=}CH{-}Ph$

IC ICM C08L075-14
ICS C08K003-22; C08L043-02
CC 37-6 (Plastics Manufacture and Processing)
ST polyurethane acrylate phosphorus flame retardance molding; water resistance polyurethane acrylate phosphorus **fireproof**; aluminum hydroxide filler **fireproof** polyurethane acrylate
IT Molded plastics, preparation
(P-containing polyurethane (meth)acrylate compns. for **flame-retardant**, water-resistant molding materials)
IT Polyurethanes, preparation
(acrylates, styrene-crosslinked; P-containing polyurethane (meth)acrylate compns. for **flame-retardant**, water-resistant molding materials)
IT Water-resistant materials
Water-resistant materials
(fire-resistant; P-containing polyurethane (meth)acrylate compns. for **flame-retardant**, water-resistant molding materials)
IT Polyurethanes, preparation
(methacrylates, crosslinked; P-containing polyurethane (meth)acrylate compns. for **flame-retardant**, water-resistant molding materials)
IT Fire-resistant materials
Fire-resistant materials
(water-resistant; P-containing polyurethane (meth)acrylate compns. for **flame-retardant**, water-resistant molding materials)
IT 303953-54-0P 303953-55-1P 303953-56-2P **303953-57-3P** **303953-58-4P**
(P-containing polyurethane (meth)acrylate compns. for **flame-retardant**, water-resistant molding materials)
IT 21645-51-2, Higilite H 32I, uses
(filler; P-containing polyurethane (meth)acrylate compns. for **flame-retardant**, water-resistant molding materials)

L34 ANSWER 19 OF 31 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2000:300837 HCAPLUS
DOCUMENT NUMBER: 132:309464
TITLE: Phosphorous-containing halogen-free resins with excellent fire resistance
INVENTOR(S): Takeuchi, Hiroshi; Uchida, Toshiaki; Okumura, Kouya
PATENT ASSIGNEE(S): Takeda Chemical Industries, Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

```
     PATENT NO.          KIND    DATE          APPLICATION NO.        DATE
     ---------------     ----    --------      --------------------
     --------
     JP 2000128929        A2     20000509      JP 1998-305186
                                                                      1998
```

1027

PRIORITY APPLN. INFO.: JP 1998-305186

1998
1027

AB The resins, useful for copper-clad laminates, contain pentavalent P atoms and C-C double bonds but no phosphate ester bonds. Thus, a mixture of 50 g a reaction product of tris(hydroxypropyl) **phosphine** oxide, maleic anhydride, succinic anhydride, glycidyl methacrylate, and styrene, 50 g vinyl ester resin containing YD 128 (epoxy resin) methacrylate and styrene, and 1.25 g Percumyl H (cumene hydroperoxide) was cured in a mold to give a test piece showing flexural modulus 3.50 GPa and glass-transition temperature 155°.

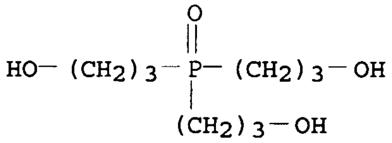
IT **266307-06-6P**, Glycidyl methacrylate-maleic anhydride-styrene-succinic anhydride-tris(3-hydroxypropyl) **phosphine** oxide-YD 128 methacrylate copolymer
(P-containing **flame retardant** resins for copper-clad laminates)

RN 266307-06-6 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, oxiranylmethyl ester, polymer with (chloromethyl)oxirane polymer with 4,4'-(1-methylethylidene)bis[phenol] 2-methyl-2-propenoate, dihydro-2,5-furandione, ethenylbenzene, 2,5-furandione and 3,3',3''-phosphinylidynetris[1-propanol] (9CI) (CA INDEX NAME)

CM 1

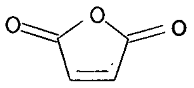
CRN 51805-42-6
CMF C9 H21 O4 P



$$HO{-}(CH_2)_3{-}\underset{\underset{(CH_2)_3{-}OH}{|}}{\overset{\overset{O}{\|}}{P}}{-}(CH_2)_3{-}OH$$

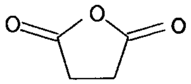
CM 2

CRN 108-31-6
CMF C4 H2 O3



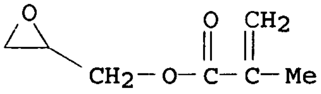
CM 3

CRN 108-30-5
CMF C4 H4 O3



CM 4

CRN 106-91-2
CMF C7 H10 O3



CM 5

CRN 100-42-5
CMF C8 H8

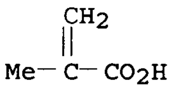
$H_2C{=}CH-Ph$

CM 6

CRN 61970-25-0
CMF (C15 H16 O2 . C3 H5 Cl O)x . x C4 H6 O2

CM 7

CRN 79-41-4
CMF C4 H6 O2



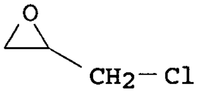
$Me-C(=CH_2)-CO_2H$

CM 8

CRN 25068-38-6
CMF (C15 H16 O2 . C3 H5 Cl O)x
CCI PMS

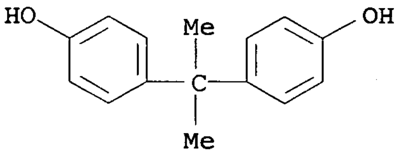
CM 9

CRN 106-89-8
CMF C3 H5 Cl O



CM 10

CRN 80-05-7
CMF C15 H16 O2



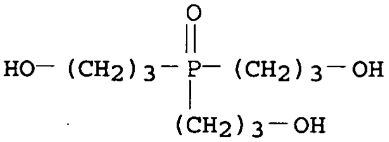
IT **266307-07-7P**, Glycidyl methacrylate-phthalic anhydride-styrene-tris(3-hydroxypropyl)**phosphine** oxide-YD 128 methacrylate copolymer **266307-08-8P**, Hydroxyethyl methacrylate-styrene-tolylene diisocyanate-tris(3-hydroxypropyl)**phosphine** oxide-YD 128 methacrylate copolymer
(P-containing **flame retardant** resins for copper-clad laminates)

RN 266307-07-7 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, oxiranylmethyl ester, polymer with (chloromethyl)oxirane polymer with 4,4'-(1-methylethylidene)bis[phenol] 2-methyl-2-propenoate, ethenylbenzene, 1,3-isobenzofurandione and 3,3',3''-phosphinylidynetris[1-propanol] (9CI) (CA INDEX NAME)

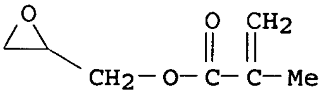
CM 1

CRN 51805-42-6
CMF C9 H21 O4 P



CM 2

CRN 106-91-2
CMF C7 H10 O3



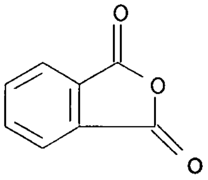
```
     CM   3

     CRN  100-42-5
     CMF  C8 H8
```

$H_2C{=}CH{-}Ph$

```
     CM   4

     CRN  85-44-9
     CMF  C8 H4 O3
```

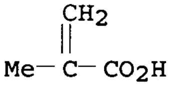


```
     CM   5

     CRN  61970-25-0
     CMF  (C15 H16 O2 . C3 H5 Cl O)x . x C4 H6 O2

          CM   6

          CRN  79-41-4
          CMF  C4 H6 O2
```



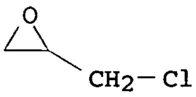
$Me{-}C(=CH_2){-}CO_2H$

```
          CM   7

          CRN  25068-38-6
          CMF  (C15 H16 O2 . C3 H5 Cl O)x
          CCI  PMS

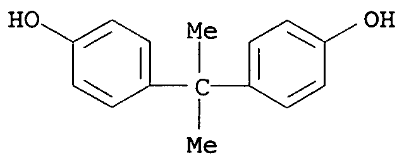
               CM   8

               CRN  106-89-8
               CMF  C3 H5 Cl O
```



CM 9

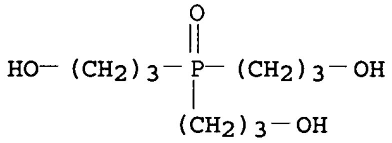
CRN 80-05-7
CMF C15 H16 O2



RN 266307-08-8 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, 2-hydroxyethyl ester, polymer with (chloromethyl)oxirane polymer with 4,4'-(1-methylethylidene)bis[phenol] 2-methyl-2-propenoate, 1,3-diisocyanatomethylbenzene, ethenylbenzene and 3,3',3''-phosphinylidynetris[1-propanol] (9CI) (CA INDEX NAME)

CM 1

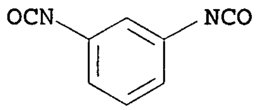
CRN 51805-42-6
CMF C9 H21 O4 P



$$\mathrm{HO{-}(CH_2)_3{-}\underset{\displaystyle |\atop (CH_2)_3{-}OH}{\overset{\displaystyle O\atop \|}{P}}{-}(CH_2)_3{-}OH}$$

CM 2

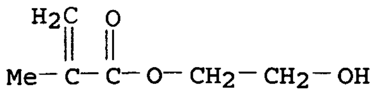
CRN 26471-62-5
CMF C9 H6 N2 O2
CCI IDS



D1— Me

CM 3

CRN 868-77-9
CMF C6 H10 O3



$Me-C(=CH_2)-C(=O)-O-CH_2-CH_2-OH$

```
     CM   4

     CRN  100-42-5
     CMF  C8 H8
```

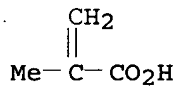
$H_2C=CH-Ph$

```
     CM   5

     CRN  61970-25-0
     CMF  (C15 H16 O2 . C3 H5 Cl O)x . x C4 H6 O2

          CM   6

          CRN  79-41-4
          CMF  C4 H6 O2
```



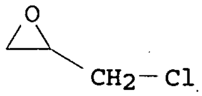
$Me-C(=CH_2)-CO_2H$

```
          CM   7

          CRN  25068-38-6
          CMF  (C15 H16 O2 . C3 H5 Cl O)x
          CCI  PMS

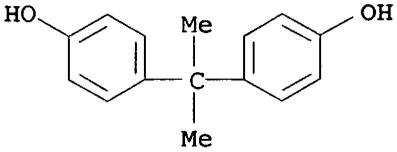
               CM   8

               CRN  106-89-8
               CMF  C3 H5 Cl O
```



```
               CM   9

               CRN  80-05-7
               CMF  C15 H16 O2
```



IC ICM C08F030-02
ICS C08F290-06; C08L101-02; C09K021-14; H05K001-03
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 35, 76
ST **hydroxypropylphosphine** oxide maleic anhydride styrene copolymer; copper clad laminate vinyl ester resin; fire resistance unsatd polyester phosphorous
IT Electric insulators
Fire-resistant materials
Printed circuit boards
(P-containing **flame retardant** resins for copper-clad laminates)
IT Acrylic rubber
(Staphyloid AC 3355, P-containing **flame retardant** resins for copper-clad laminates)
IT Epoxy resins, uses
(acrylates, crosslinked; P-containing **flame retardant** resins for copper-clad laminates)
IT Polyurethanes, uses
(acrylic, P-containing, crosslinked; P-containing **flame retardant** resins for copper-clad laminates)
IT Polyesters, uses
(unsatd., P-containing, crosslinked; P-containing **flame retardant** resins for copper-clad laminates)
IT **266307-06-6P**, Glycidyl methacrylate-maleic anhydride-styrene-succinic anhydride-tris(3-hydroxypropyl) **phosphine** oxide-YD 128 methacrylate copolymer
(P-containing **flame retardant** resins for copper-clad laminates)
IT 266302-54-9P, Glycidyl methacrylate-maleic anhydride-styrene-succinic anhydride-tris(3-hydroxypropyl)**phosphine** oxide copolymer **266307-07-7P**, Glycidyl methacrylate-phthalic anhydride-styrene-tris(3-hydroxypropyl)**phosphine** oxide-YD 128 methacrylate copolymer **266307-08-8P**, Hydroxyethyl methacrylate-styrene-tolylene diisocyanate-tris(3-hydroxypropyl)**phosphine** oxide-YD 128 methacrylate copolymer
(P-containing **flame retardant** resins for copper-clad laminates)

L34 ANSWER 20 OF 31 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER:	2000:68507 HCAPLUS
DOCUMENT NUMBER:	132:123724
TITLE:	**Flame-retardant**, open-celled, microporous polymeric foams
INVENTOR(S):	Dyer, John Collins
PATENT ASSIGNEE(S):	Procter and Gamble Company, USA
SOURCE:	PCT Int. Appl., 48 pp. CODEN: PIXXD2
DOCUMENT TYPE:	Patent
LANGUAGE:	English
FAMILY ACC. NUM. COUNT:	1

```
PATENT INFORMATION:

     PATENT NO.          KIND   DATE        APPLICATION NO.         DATE
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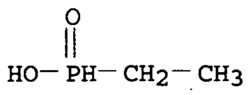
     WO 2000004080        A1    20000127    WO 1999-US16136
                                                                    1999
                                                                    0716
         W:  AE, AL, AM, AT, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH,
             CN, CU, CZ, CZ, DE, DE, DK, DK, EE, EE, ES, FI, FI, GB,
             GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP,
             KR, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN,
             MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK,
             SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ,
             BY, KG, KZ, MD, RU, TJ, TM
         RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY,
             DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE,
             BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG
     US 6160028           A     20001212    US 1998-118613
                                                                    1998
                                                                    0717
     CA 2337767           AA    20000127    CA 1999-2337767
                                                                    1999
                                                                    0716
     AU 9950006           A1    20000207    AU 1999-50006
                                                                    1999
                                                                    0716
     EP 1115779           A1    20010718    EP 1999-934096
                                                                    1999
                                                                    0716
         R:  AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE,
             MC, PT, IE, SI, LT, LV, FI, RO
     JP 2002520465        T2    20020709    JP 2000-560184
                                                                    1999
                                                                    0716
PRIORITY APPLN. INFO.:                      US 1998-118613       A
                                                                    1998
                                                                    0717

                                            WO 1999-US16136      W
                                                                    1999
                                                                    0716
```

AB Disclosed are microporous, open-celled polymeric foams formed by polymerizing water-in-oil emulsions having a ratio of the internal water phase to the oil phase of ≥3:1, where the foam has a Limiting Oxygen Index (LOI) value of at least about 18 %. The foams have a variety of **flame retardant** applications, including use in insulation. The flame retardancy is conferred on the foams by ≥1 of the methods: (a) using monomers containing ≥1 of Cl, Br, P, B, or Sb, (b) adding polymers containing these elements, (c) adding the usual **flame retardant** additives, or (d) adding inorg. salts containing these elements. A typical foam was manufactured by polymerization of an emulsion with water-oil ratio 40:1 having an oil phase containing chloroprene 77, Sb2O3 3, and divinylbenzene 20% in the presence of K2S2O8, CaCl2, and diglycerol monooleate emulsifier. The emulsion was cured 18 h at 45° and then 18 h at 65°.

IT **81323-94-6**, Sodium **ethylphosphinate**
(**fireproofing** agent; **flame-**

retardant, open-celled, microporous polymeric foams)
RN 81323-94-6 HCAPLUS
CN Phosphinic acid, ethyl-, sodium salt (9CI) (CA INDEX NAME)

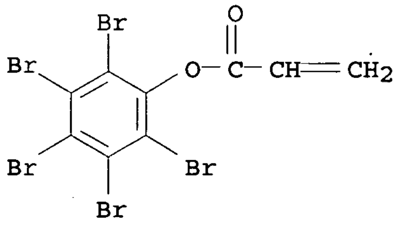

$\mathrm{HO-\overset{O}{\overset{\|}{P}}H-CH_2-CH_3}$

● Na

IT **255877-13-5P**, Divinylbenzene-ethylstyrene-pentabromophenyl acrylate copolymer
(**flame-retardant**, open-celled, microporous polymeric foams)
RN 255877-13-5 HCAPLUS
CN 2-Propenoic acid, pentabromophenyl ester, polymer with 1,4-diethenylbenzene and ethenylethylbenzene (9CI) (CA INDEX NAME)

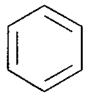
CM 1

CRN 52660-82-9
CMF C9 H3 Br5 O2



CM 2

CRN 28106-30-1
CMF C10 H12
CCI IDS

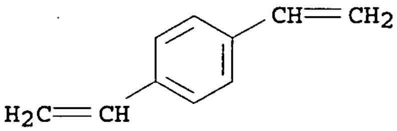


D1—CH═CH2

D1—Et

CM 3

CRN 105-06-6
CMF C10 H10



IC ICM C08J009-28
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 37
ST **flame retardant** open celled microporous foam;
antimony trioxide contg open celled microporous foam; chloroprene
divinylbenzene copolymer microporous foam manuf
IT Polyphosphoric acids
(ammonium salts, **fireproofing** agent; **flame-retardant**, open-celled, microporous polymeric foams)
IT Paraffin waxes, uses
(chloro, **fireproofing** agent; **flame-retardant**, open-celled, microporous polymeric foams)
IT Fire-resistant materials
Fireproofing agents
(**flame-retardant**, open-celled, microporous polymeric foams)
IT Plastic foams
(**flame-retardant**, open-celled, microporous polymeric foams)
IT Alkanes, uses
(halo, **fireproofing** agent; **flame-retardant**, open-celled, microporous polymeric foams)
IT Porous materials
(microporous; **flame-retardant**, open-celled, microporous polymeric foams)
IT Quaternary ammonium compounds, uses
(polymers, hexachloroantimoate, phosphate, or borate, **fireproofing** agent; **flame-retardant**
, open-celled, microporous polymeric foams)
IT 1163-19-5, Decabromodiphenyl oxide 1345-04-6, Antimony trisulfide 6294-34-4, Bis(2-chloroethyl) 2-chloroethylphosphonate 7789-41-5, Calcium bromide 9002-85-1, Polyvinylidene chloride 9002-86-2, Polyvinyl chloride
10043-52-4, Calcium chloride, uses 10103-46-5, Calcium phosphate
10124-31-9, Ammonium phosphate 10433-06-4, Antimony triethoxide
11128-98-6, Ammonium borate 12040-58-3, Calcium borate
13840-56-7, Sodium borate 14713-43-0, Antimony phosphate
22690-72-8, Ammonium tripolyphosphate 22690-73-9, Ammonium pyrophosphate 25637-99-4, Hexabromocyclododecane 25951-54-6, Polyvinyl bromide 28300-74-5, Antimony potassium tartarate
29972-06-3, Ammonium hexametaphosphate 40120-74-9,
Tris(1,3-dichloropropyl) phosphate 51736-72-2, Polyvinylidene bromide 67360-50-3, Poly(diphenyl vinyl phosphate)
81323-94-6, Sodium **ethylphosphinate**
97508-22-0, Calcium tetrachlorophthalate 179730-34-8, Antimony boron oxide 255877-16-8, Antimony caproate

(**fireproofing** agent; **flame-retardant**, open-celled, microporous polymeric foams)

IT 9052-95-3P, Divinylbenzene-ethylstyrene-styrene copolymer 255877-11-3P, Chloroprene-divinylbenzene-ethylstyrene copolymer 255877-12-4P, 2,3-Dichloro-1,3-butadiene-divinylbenzene-ethylstyrene copolymer **255877-13-5P**, Divinylbenzene-ethylstyrene-pentabromophenyl acrylate copolymer 255877-14-6P

(**flame-retardant**, open-celled, microporous polymeric foams)

IT 1309-64-4, Antimony trioxide, uses 13560-89-9, Dechlorane Plus 255918-50-4, Antiblaze 125 256381-07-4, Antiblaze TDCP/LV

(**flame-retardant**, open-celled, microporous polymeric foams)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 21 OF 31 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1997:802203 HCAPLUS
DOCUMENT NUMBER: 128:102959
TITLE: **Flame-retardant** and halogen-free resin compositions containing phosphorous compounds and their laminates
INVENTOR(S): Miyake, Sumiya; Ito, Mikio
PATENT ASSIGNEE(S): Sumitomo Bakelite Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

```
     PATENT NO.          KIND    DATE         APPLICATION NO.          DATE
     ---------------     ----    --------     --------------------
     --------
     JP 09324108          A2     19971216     JP 1996-145624
                                                                       1996
                                                                       0607
     TW 388768            B      20000501     TW 1997-86118382
                                                                       1997
                                                                       1206
PRIORITY APPLN. INFO.:                        JP 1996-145624       A
                                                                       1996
                                                                       0607

                                              JP 1996-252903       A
                                                                       1996
                                                                       0925
```

AB The compns. with good moisture resistance contain (a) ≥2 epoxy-containing epoxy resins except halogenated epoxy reins, (b) ≥1 resins selected from ≥1 maleimide-containing maleimides, ≥2 cyanate-containing cyanates, and ≥2 isocyanate-containing isocyanates, and (c) P-containing compds. and satisfy N content 1-10% and P content 0.5-6%. The laminates composed of the compns. and base materials are also claimed. Thus, Epiclon N 770 (phenol novolaks) 22, BMI-H [diaminodiphenylmethane (I)-type bismaleimides] 42.5, I 13.5, and tri-Ph phosphate 22 parts were dissolved in 1:1 mixture of DMF and

```
     Me Et ketone to give a 50% vanish, which was impregnated to a
     glass cloth and dried to give a prepreg.  Then, the prepregs were
     laminated and applied 2 Cu foils and 2 stainless steel plates on
     the both sides in this order to give a test piece showing UL 94
     flame retardance V-0 and good solder heat resistance.
IT   201354-32-7P
        (flame-retardant and halogen-free resin
        compns. prepared from phosphorous compds. and their laminates)
RN   201354-32-7  HCAPLUS
CN   1H-Pyrrole-2,5-dione, 1-(4-hydroxyphenyl)-, polymer with Epiclon N
     770, 2,2,4,4,6,6-hexahydro-2,2,4,4,6,6-hexakis[2-[(2-methyl-1-oxo-
     2-propenyl)oxy]ethoxy]-1,3,5,2,4,6-triazatriphosphorine and
     4,4'-methylenebis[benzenamine] (9CI)  (CA INDEX NAME)

     CM   1

     CRN  99241-45-9
     CMF  Unspecified
     CCI  PMS, MAN

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

     CM   2

     CRN  92832-53-6
     CMF  C36 H54 N3 O18 P3
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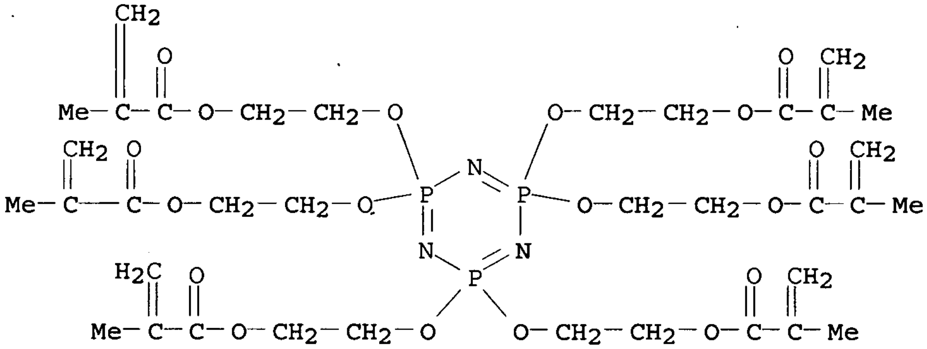

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     CM   3

     CRN  7300-91-6
     CMF  C10 H7 N O3
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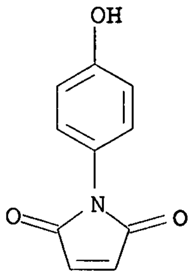
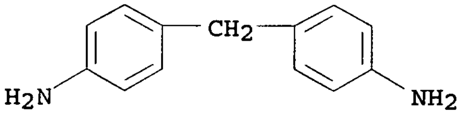


CM 4

CRN 101-77-9
CMF C13 H14 N2



IC ICM C08L063-00
ICS C08G059-00; C08G059-40; C08K005-49
CC 37-6 (Plastics Manufacture and Processing)
IT Polyimides, preparation
Polyimides, preparation
(epoxy, polyisocyanurate-polyoxyphenylene; **flame-retardant** and halogen-free resin compns. prepared from phosphorous compds. and their laminates)
IT Polyoxyphenylenes
Polyoxyphenylenes
Polyoxyphenylenes
(epoxy-polyisocyanurate-, polyimide; **flame-retardant** and halogen-free resin compns. prepared from phosphorous compds. and their laminates)
IT Polyisocyanurates
Polyisocyanurates
Polyisocyanurates
(epoxy-polyoxyphenylene-, polyimide; **flame-retardant** and halogen-free resin compns. prepared from phosphorous compds. and their laminates)
IT Laminated materials
Laminated materials
(fire-resistant; **flame-retardant** and halogen-free resin compns. prepared from phosphorous compds. and their laminates)
IT Fire-resistant materials
(**flame-retardant** and halogen-free resin compns. prepared from phosphorous compds. and their laminates)
IT Fire-resistant materials
Fire-resistant materials
(laminates; **flame-retardant** and halogen-free resin compns. prepared from phosphorous compds. and their laminates)
IT Phenolic resins, preparation

(novolak, reaction products, PCR, cyanate esters, polymer with Ep 1001 and TD 2093; **flame-retardant** and halogen-free resin compns. prepared from phosphorous compds. and their laminates)

IT Epoxy resins, preparation
Epoxy resins, preparation
(polyimide-, polyisocyanurate-polyoxyphenylene; **flame-retardant** and halogen-free resin compns. prepared from phosphorous compds. and their laminates)

IT Epoxy resins, preparation
Epoxy resins, preparation
Epoxy resins, preparation
(polyisocyanurate-polyoxyphenylene-, polyimide; **flame-retardant** and halogen-free resin compns. prepared from phosphorous compds. and their laminates)

IT Phenolic resins, preparation
(polymer with Epiclon N 770 and a cyanate ester; **flame-retardant** and halogen-free resin compns. prepared from phosphorous compds. and their laminates)

IT Phenolic resins, preparation
(reaction products with tri-Bu phosphate, polymer with BMI-H, diaminodiphenylmethane, and Epiclon N 770; **flame-retardant** and halogen-free resin compns. prepared from phosphorous compds. and their laminates)

IT 101-77-9DP, Diaminodiphenylmethane, polymer with Epiclon N 770, Ep 1001, Tepic S, BMI-H, Sumidur 44S, and a cyanate ester 126-73-8DP, Tributyl phosphate, reaction products with PR 51470, polymer with BMI-H, diaminodiphenylmethane, and Epiclon N 770 9003-35-4DP, TD 2093, polymer with Epiclon N 770 and a cyanate ester 9003-35-4DP, PR 51470, reaction products with tri-Bu phosphate, polymer with BMI-H, diaminodiphenylmethane, and Epiclon N 770 13676-54-5DP, BMI-H, polymer with Epiclon N 770, Ep 1001, Tepic S, Sumidur 44S, diaminodiphenylmethane, and a cyanate ester 25068-38-6DP, Ep 1001, polymer with Tepic S, a cyanate ester, and TD 2093 28825-96-9DP, Tepic S, polymer with Ep 1001, a cyanate ester, and TD 2093 88403-23-0DP, Sumidur 44S, polymer with Epiclon N 770, Ep 1001, Tepic S, BMI-H, diaminodiphenylmethane, and a cyanate ester 201016-06-0DP, polymer with PR 51470 and tri-Bu phosphate 201016-06-0P 201016-07-1P 201016-09-3P 201016-10-6P 201016-11-7DP, polymer with phenol novolak and tri-Bu phosphate 201016-12-8DP, polymer with phenol novolak and tri-Bu phosphate 201016-13-9P 201016-14-0P **201354-32-7P** 201354-33-8P
(**flame-retardant** and halogen-free resin compns. prepared from phosphorous compds. and their laminates)

IT 115-86-6, Triphenyl phosphate 791-28-6, **Triphenylphosphine** oxide 7723-14-0, Red phosphorus, uses
(**flame-retardant** and halogen-free resin compns. prepared from phosphorous compds. and their laminates)

L34 ANSWER 22 OF 31 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER:	1996:363493 HCAPLUS
DOCUMENT NUMBER:	125:12364
TITLE:	Flame-resistant single-component photocurable resin composition
INVENTOR(S):	Plundrich, Winfried; Wipfelder, Ernst
PATENT ASSIGNEE(S):	Siemens A.-G., Germany
SOURCE:	PCT Int. Appl., 18 pp. CODEN: PIXXD2
DOCUMENT TYPE:	Patent

```
LANGUAGE:                English
FAMILY ACC. NUM. COUNT:  1
PATENT INFORMATION:

     PATENT NO.          KIND  DATE         APPLICATION NO.        DATE
     ---------------     ----  --------     --------------------
     --------
     WO 9607678           A1   19960314     WO 1995-DE1202
                                                                   1995
                                                                   0905
         W:  JP, US
         RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL,
             PT, SE
     DE 4431751           C1   19960509     DE 1994-4431751
                                                                   1994
                                                                   0906
     EP 779900            A1   19970625     EP 1995-929754
                                                                   1995
                                                                   0905
         R:  AT, BE, CH, DE, FR, GB, IT, LI, NL
     JP 10505122          T2   19980519     JP 1995-509120
                                                                   1995
                                                                   0905
     US 5804680           A    19980908     US 1997-793689
                                                                   1997
                                                                   0305
PRIORITY APPLN. INFO.:                      DE 1994-4431751     A
                                                                   1994
                                                                   0906

                                            WO 1995-DE1202      W
                                                                   1995
                                                                   0905
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AB A single-component resin composition curable by UV irradiation consists of (A) a P-containing acrylate; (B) another unsatd. compound that may be radically copolymd. with acrylates; and (C) a radical-generating photoinitiator system. The resins are useful for masking electronic components and may be completely hardened by UV irradiation into a flame-resistant masking material. Thus, a P-containing monomer (I) was obtained by reaction of MeCH2CHMeP(O)(CH2CH2CH2OH)2 with 2-isocyanatoethyl methacrylate. A composition of I 43.05, Ebecryl 600 (epoxy resin acrylate) 29.49, trimethylolpropane triacrylate 5.9, Irgacure 907 0.39, Quantacure ITX 0.39, Luperox 231-50 0.78 and Al(OH)3 20.00 parts was storage-stable at room temperature and cured in 30 s by UV irradiation; its UL-94 rating was V-0 for thicknesses ≤1.6 mm.

IT **177715-58-1P**
(preparation of fire-resistant polymers from P-containing acrylate monomers)

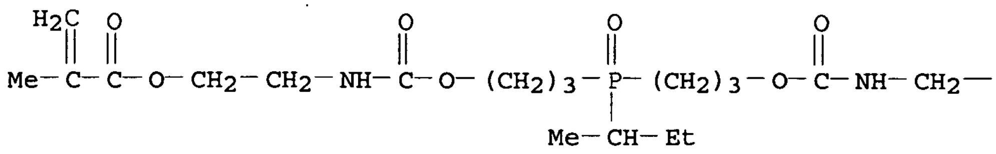
RN 177715-58-1 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 9-(1-methylpropyl)-9-oxido-4,14-dioxo-5,13-dioxa-3,15-diaza-9-phosphaheptadecane-1,17-diyl ester, polymer with 2-ethyl-2-[[(1-oxo-2-propenyl)oxy]methyl]-1,3-propanediyl di-2-propenoate and (1-methylethylidene)bis[4,1-phenyleneoxy(2-hydroxy-3,1-propanediyl)] di-2-propenoate (9CI) (CA INDEX NAME)

CM 1

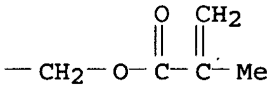
CRN 177715-55-8
CMF C24 H41 N2 O9 P

PAGE 1-A



$\mathrm{Me{-}\overset{H_2C}{\overset{\|}{C}}{-}\overset{O}{\overset{\|}{C}}{-}O{-}CH_2{-}CH_2{-}NH{-}\overset{O}{\overset{\|}{C}}{-}O{-}(CH_2)_3{-}\underset{Me-CH-Et}{\overset{O}{\overset{\|}{P}}}{-}(CH_2)_3{-}O{-}\overset{O}{\overset{\|}{C}}{-}NH{-}CH_2{-}}$

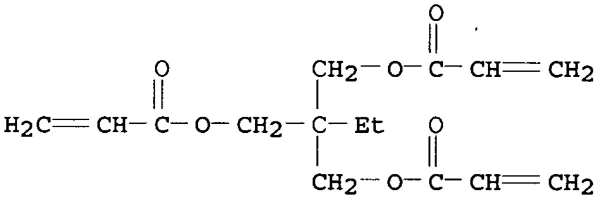
PAGE 1-B



$\mathrm{{-}CH_2{-}O{-}\overset{O}{\overset{\|}{C}}{-}\overset{CH_2}{\overset{\|}{C}}{-}Me}$

CM 2

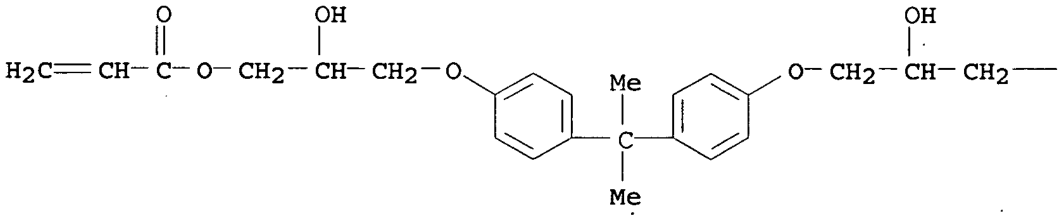
CRN 15625-89-5
CMF C15 H20 O6



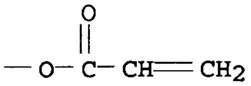
CM 3

CRN 4687-94-9
CMF C27 H32 O8

PAGE 1-A



PAGE 1-B


$-O-C(=O)-CH=CH_2$

IC ICM C08F030-02

CC 37-3 (Plastics Manufacture and Processing)
Section cross-reference(s): 74, 76

ST phosphorus contg acrylic monomer; **fireproofing** agent acrylate copolymer; photoresist flame retardance

IT 868-77-9, 2-Hydroxyethyl methacrylate 920-46-7, Methacryloyl chloride 18795-26-1, Diglycidyl phenylphosphonate 30674-80-7, 2-Isocyanatoethyl methacrylate 79579-99-0, sec-Butylbis(3-hydroxypropyl)**phosphine** oxide
(monomer precursor; preparation of P-containing acrylate monomers for manufacture of fire-resistant polymers)

IT **177715-58-1P** 177715-59-2P
(preparation of fire-resistant polymers from P-containing acrylate monomers)

L34 ANSWER 23 OF 31 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER:	1994:325021 HCAPLUS
DOCUMENT NUMBER:	120:325021
TITLE:	Maleimide-type fire-resistant resin compositions
INVENTOR(S):	Kudo, Noriaki; Watanabe, Atsushi; Higano, Masanori
PATENT ASSIGNEE(S):	Denki Kagaku Kogyo Kk, Japan
SOURCE:	Jpn. Kokai Tokkyo Koho, 7 pp. CODEN: JKXXAF
DOCUMENT TYPE:	Patent
LANGUAGE:	Japanese
FAMILY ACC. NUM. COUNT:	1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 05320459	A2	19931203	JP 1992-148024	1992 0515
PRIORITY APPLN. INFO.:			JP 1992-148024	1992 0515

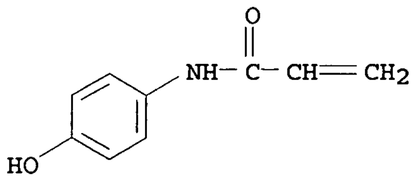
AB The title compns. contain P compds. and thermoplastic resin compns. containing nuclear Me-substituted aromatic maleimides and/or nuclear OH-substituted aromatic maleimides as monomer components. Thus, 100:67 vinyltoluene-maleic anhydride copolymer prepared in the presence of Bz_2O_2 was treated with 74 parts p-hydroxyaniline at 150° for 10 h, precipitated, filtered, and dried to give a polymer, 100 parts of which was kneaded with 15 parts TPP (PPh_3), melt-extrusion molded at 250°, pelletized, and injection molded to give a 1/16''-test piece showing UL-94 flame retardance V-0.

IT **155519-13-4P**
(preparation of, rubber, blends with phosphate-containing maleimides,

with fire resistance)
RN 155519-13-4 HCAPLUS
CN 2-Propenamide, N-(4-hydroxyphenyl)-, polymer with 1,3-butadiene, ethenylmethylbenzene and 2-propenenitrile, graft (9CI) (CA INDEX NAME)

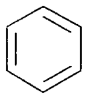
CM 1

CRN 34443-04-4
CMF C9 H9 N O2



CM 2

CRN 25013-15-4
CMF C9 H10
CCI IDS



D1— Me

$D1-CH=CH_2$

CM 3

CRN 107-13-1
CMF C3 H3 N

$H_2C=CH-C\equiv N$

CM 4

CRN 106-99-0
CMF C4 H6

$H_2C=CH-CH=CH_2$

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IC    ICM  C08L035-00
      ICS  C08K005-52; C08L025-16; C08L025-18
CC    37-6 (Plastics Manufacture and Processing)
IT    603-35-0, Triphenylphosphine, uses
         (flame retardants, maleimides containing)
IT    155519-13-4P
         (preparation of, rubber, blends with phosphate-containing maleimides,
         with fire resistance)

L34  ANSWER 24 OF 31  HCAPLUS  COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER:         1993:651315  HCAPLUS
DOCUMENT NUMBER:          119:251315
TITLE:                    Halogen-free flame-resistant thermoplastic
                          molding compositions based on a
                          polyoxyphenylene
INVENTOR(S):              Zeltner, Doris; Niessner, Norbert; Seitz,
                          Friedrich; Neumann, Rainer; Seelert, Stefan
PATENT ASSIGNEE(S):       BASF A.-G., Germany
SOURCE:                   Eur. Pat. Appl., 9 pp.
                          CODEN: EPXXDW
DOCUMENT TYPE:            Patent
LANGUAGE:                 German
FAMILY ACC. NUM. COUNT:   2
PATENT INFORMATION:

     PATENT NO.          KIND   DATE        APPLICATION NO.        DATE
     ---------------     ----   --------    --------------------
     --------
     EP 530692            A2    19930310    EP 1992-114707
                                                                   1992
                                                                   0828
     EP 530692            A3    19930331
        R:  BE, DE, FR, GB, NL
     DE 4129765           A1    19930311    DE 1991-4129765
                                                                   1991
                                                                   0906
PRIORITY APPLN. INFO.:                      DE 1991-4129765     A
                                                                   1991
                                                                   0906

AB    The title compns., showing good toughness and high heat
      deformation temperature, contain a migration-resistant
      fireproofing agent prepared by the (co)polymerization of a P compound
      R1CR2:CR3(U)m(R6)n(V)pP[(W)q][(Y)sR4](X)rR5 [V, W, X, Y = O, S,
      NR9; Z = O, S, NR10R11; U = CO2, O, S, NR9; R1-5, R10-11 = H,
      alkyl, cycloalkyl, aralkyl, aryl; R6 = (R7)tC[(Z)v](R8)u; R7-9 =
      alkylidene, cycloalkylidene, aralkylidene, arylidene; m, p, q, r,
      s, t, u, v = 0-1; n = 0-2].  A composition containing 55%
      poly[oxy(2,6-dimethyl-1,4-phenylene)], 36% impact-resistant
      polystyrene (containing 9% polybutadiene), 4.5%
      H2C:CMeCO2CHMeOP(O)(OPh)2-styrene copolymer, and 4.5% Ph3P:O had
      Vicat softening temperature 143° and fire resistance (UL 94) V-1.
IT    151205-20-8 151205-21-9
         (fireproofing agents, for polyoxyphenylene-styrene
         polymer blends, migration-resistant)
RN    151205-20-8  HCAPLUS
CN    2-Propenoic acid, 2-methyl-, 1-[(diphenoxyphosphinyl)oxy]ethyl
      ester, polymer with ethenylbenzene (9CI)  (CA INDEX NAME)
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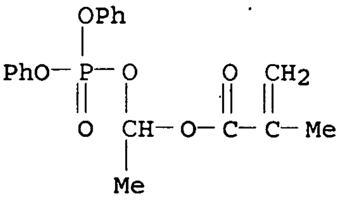
CM 1

CRN 151205-19-5
CMF C18 H19 O6 P



CM 2

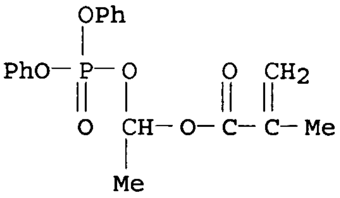
CRN 100-42-5
CMF C8 H8

$H_2C{=}CH{-}Ph$

RN 151205-21-9 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, 1-[(diphenoxyphosphinyl)oxy]ethyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 151205-19-5
CMF C18 H19 O6 P



IC ICM C08L071-12
ICS C08L025-06; C08L043-02; C08K003-22; C08K005-49
CC 37-3 (Plastics Manufacture and Processing)
ST polyoxyphenylene styrene polymer blend **fireproofing**; **fireproofing** polyoxyphenylene phosphorus compd polymer; phosphate methacryloyloxyethyl polymer **fireproofing**; migration resistance **fireproofing** agent; impact strength polyoxyphenylene blend **fireproofing**
IT **Fireproofing** agents
(phosphorus-containing polymers, for polyoxyphenylene-styrene polymer blends, migration-resistant)
IT Impact-resistant materials
(polyoxyphenylene-styrene polymer blends containing **fireproofing** agents)
IT Plastics, molded
(polyoxyphenylene-styrene polymer blends, **fireproofing**

agents for, migration-resistant)
IT Polyoxyphenylenes
(polymers, blends with styrene, **fireproofing** of,
phosphorus-containing polymers for)
IT 9003-55-8, Butadiene-styrene copolymer
(blends with polyoxyphenylenes, **fireproofing** of,
phosphorus-containing polymers for)
IT 24938-67-8, Poly[oxy(2,6-dimethyl-1,4-phenylene)] 25134-01-4,
2,6-Dimethylphenol polymer
(blends with styrene polymers, **fireproofing** of,
phosphorus-containing polymers for)
IT 791-28-6, **Triphenylphosphine** oxide
(**fireproofing** agents, for polyoxyphenylene-styrene
polymer blends)
IT **151205-20-8 151205-21-9**
(**fireproofing** agents, for polyoxyphenylene-styrene
polymer blends, migration-resistant)

L34 ANSWER 25 OF 31 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1988:76389 HCAPLUS
DOCUMENT NUMBER: 108:76389
TITLE: Polymer compositions resisting fire, heat and impact
INVENTOR(S): Mori, Kyozo; Kobayashi, Yasuo
PATENT ASSIGNEE(S): Daicel Chemical Industries, Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

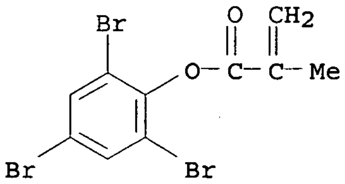
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	JP 62143962	A2	19870627	JP 1985-284455	1985 1219
PRIORITY APPLN. INFO.:				JP 1985-284455	1985 1219

AB The title compns., with low emission of corrosive gases in
processing or bleeding of **flame retardants**,
comprise 100 parts ABS modified with 97-75% mixture of styrenes and
acrylonitrile (I) 50-87, bromophenyl (meth)acrylates 8-35, and
maleic anhydride (II) 5-25%; and 0.5-10 parts **phosphine**
and/or **phosphine** oxide with b.p. ≥240°.
Heating SBR 153, styrene 2346, I 351, 2,4,3-tribromophenyl
methacrylate 255, II 210, and PhMe 25 parts with 0.35% (based on
monomers) lauroyl peroxide at 75° for 5 h gave a graft
polymer. This polymer, containing 3 phr Ph_3P, had UL-94 flammability
V-2, heat distortion temperature 100°, and notched Izod impact
strength 8.5 kg-cm/cm; vs. HB, 103, and 8.4, resp., without Ph_3P.
IT **112720-81-7**, Acrylonitrile-butadiene-maleic
anhydride-styrene-2,4,6-tribromophenyl methacrylate graft
copolymer
(**fireproofing** agents for, **phosphine** derivs.
as)
RN 112720-81-7 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2,4,6-tribromophenyl ester, polymer with 1,3-butadiene, ethenylbenzene, 2,5-furandione and 2-propenenitrile, graft (9CI) (CA INDEX NAME)

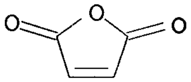
CM 1

CRN 37721-71-4
CMF C10 H7 Br3 O2



CM 2

CRN 108-31-6
CMF C4 H2 O3



CM 3

CRN 107-13-1
CMF C3 H3 N

$H_2C{=}CH{-}C{\equiv}N$

CM 4

CRN 106-99-0
CMF C4 H6

$H_2C{=}CH{-}CH{=}CH_2$

CM 5

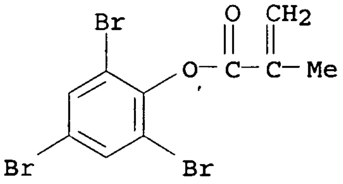
CRN 100-42-5
CMF C8 H8

$H_2C{=}CH{-}Ph$

IT **112755-17-6**
(graft polymer blends, **fireproofing** of, with
phosphine derivs.)
RN 112755-17-6 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, 2,4,6-tribromophenyl ester, polymer
with ethenylbenzene, 2,5-furandione and 2-propenenitrile (9CI)
(CA INDEX NAME)

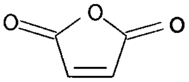
CM 1

CRN 37721-71-4
CMF C10 H7 Br3 O2



CM 2

CRN 108-31-6
CMF C4 H2 O3



CM 3

CRN 107-13-1
CMF C3 H3 N

$H_2C{=}CH{-}C{\equiv}N$

CM 4

CRN 100-42-5
CMF C8 H8

$H_2C{=}CH{-}Ph$

IC ICM C08L055-02
ICS C08K005-50; C08K005-53
CC 37-3 (Plastics Manufacture and Processing)
Section cross-reference(s): 39

ST **fireproofing** agent graft polymer; bromophenyl methacrylate graft polymer; **phosphine** **fireproofing** agent; acrylonitrile graft polymer **fireproofing**; maleic anhydride copolymer **fireproofing**; styrene graft polymer **fireproofing** ; butadiene graft polymer **fireproofing**; methacrylate tribromophenyl graft polymer

IT Plastics, molded
(graft polymer-bromophenyl methacrylate copolymer blends, **fireproofing** of)

IT **Fireproofing** agents
(**phosphine** derivs., for grafted ABS blends)

IT 106677-58-1
(blends with halophenyl (meth)acrylate copolymers, **fireproofing** of)

IT **112720-81-7**, Acrylonitrile-butadiene-maleic anhydride-styrene-2,4,6-tribromophenyl methacrylate graft copolymer
(**fireproofing** agents for, **phosphine** derivs. as)

IT 603-35-0, uses and miscellaneous 791-28-6, **Triphenylphosphine** oxide
(**flame retardants**, for graft polymers)

IT **112755-17-6**
(graft polymer blends, **fireproofing** of, with **phosphine** derivs.)

L34 ANSWER 26 OF 31 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1988:38999 HCAPLUS
DOCUMENT NUMBER: 108:38999
TITLE: Heat-resistant **flame-retardant** resin compositions
INVENTOR(S): Mori, Kyozo; Kobayashi, Yasuo
PATENT ASSIGNEE(S): Daicel Chemical Industries, Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

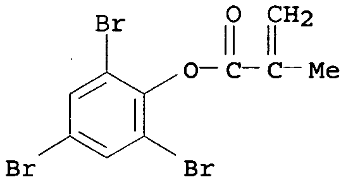
```
     PATENT NO.          KIND   DATE        APPLICATION NO.          DATE
     ---------------     ----   --------    --------------------
     --------
     JP 62143960          A2    19870627    JP 1985-284453
                                                                     1985
                                                                     1219
PRIORITY APPLN. INFO.:                      JP 1985-284453
                                                                     1985
                                                                     1219
```

AB The title compns., with good impact resistance, contain graft polymers from 3-25% rubber and 97-75% mixture of vinylarom. compds., acrylonitrile (I) 50-87, halophenyl (meth)acrylates 8-35, and maleic anhydride (II)-N-phenylmaleimide (III) 5-30%, and 0.5-10 phr **phosphines** and/or **phosphine** oxides (b.p. ≥240°). Heating a solution of SBR 153, styrene 2346, I 351, 2,4,6-tribromophenyl methacrylate 255, II 105, III 105, and PhMe 750 g with a peroxide at 75° for 5 h gave 1616 g graft polymer. This polymer, containing 3 phr Ph_3P, had UL-94 flammability

```
     V-2, heat distortion temperature 99°, and notched Izod impact
     strength 8.0 kg-cm/cm; vs HB, 102, and 8.0, resp., without Ph3P.
IT   112409-87-7, Acrylonitrile-maleic anhydride-N-
     phenylmaleimide-styrene-2,4,6-tribromophenyl methacrylate
     copolymer
        (blends with graft polymers, fireproofing agents for
        impact-resistant)
RN   112409-87-7  HCAPLUS
CN   2-Propenoic acid, 2-methyl-, 2,4,6-tribromophenyl ester, polymer
     with ethenylbenzene, 2,5-furandione, 1-phenyl-1H-pyrrole-2,5-dione
     and 2-propenamide (9CI)  (CA INDEX NAME)

     CM   1

     CRN  37721-71-4
     CMF  C10 H7 Br3 O2
```



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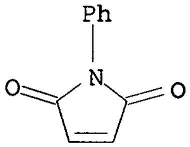
     CM   2

     CRN  941-69-5
     CMF  C10 H7 N O2
```



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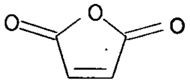
     CM   3

     CRN  108-31-6
     CMF  C4 H2 O3
```



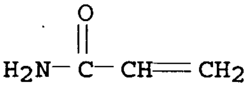
```
     CM   4

     CRN  100-42-5
     CMF  C8 H8
```

$H_2C{=}CH{-}Ph$

CM 5

CRN 79-06-1
CMF C3 H5 N O

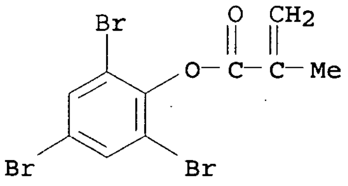


$H_2N{-}\overset{\overset{\displaystyle O}{\|}}{C}{-}CH{=}CH_2$

IT **112409-72-0**, Acrylonitrile-butadiene-maleic
anhydride-N-phenylmaleimide-styrene-2,4,6-tribromophenyl
methacrylate graft copolymer
(**fireproofing** agents for, **phosphines** and
phosphine oxides as)
RN 112409-72-0 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, 2,4,6-tribromophenyl ester, polymer
with 1,3-butadiene, ethenylbenzene, 2,5-furandione,
1-phenyl-1H-pyrrole-2,5-dione and 2-propenamide, graft (9CI) (CA
INDEX NAME)

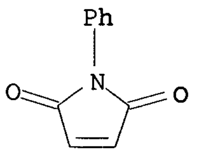
CM 1

CRN 37721-71-4
CMF C10 H7 Br3 O2



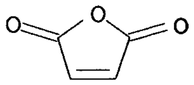
CM 2

CRN 941-69-5
CMF C10 H7 N O2



CM 3

CRN 108-31-6
CMF C4 H2 O3



CM 4

CRN 106-99-0
CMF C4 H6

$H_2C{=}CH{-}CH{=}CH_2$

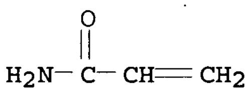
CM 5

CRN 100-42-5
CMF C8 H8

$H_2C{=}CH{-}Ph$

CM 6

CRN 79-06-1
CMF C3 H5 N O



$H_2N{-}C({=}O){-}CH{=}CH_2$

IC ICM C08L055-02
ICS C08K005-50; C08K005-53

CC 37-5 (Plastics Manufacture and Processing)
Section cross-reference(s): 39

ST **fireproofing** graft polymer; bromophenyl methacrylate copolymer **fireproofing**; **phosphine** deriv **fireproofing** agent; phenylmaleimide copolymer **fireproofing**; maleic anhydride copolymer **fireproofing**; SBR grafted **fireproofing**; acrylonitrile copolymer **fireproofing**; methacrylate tribromophenyl copolymer **fireproofing**

IT **Fireproofing** agents
(**phosphines** and **phosphine** oxides, for impact-resistant graft polymers)

IT **112409-87-7**, Acrylonitrile-maleic anhydride-N-phenylmaleimide-styrene-2,4,6-tribromophenyl methacrylate copolymer
(blends with graft polymers, **fireproofing** agents for impact-resistant)

IT 106677-58-1
(blends with halophenyl (meth)acrylate polymers,

fireproofing of)

IT 603-35-0, **Triphenylphosphine**, uses and miscellaneous
791-28-6, **Triphenylphosphine** oxide
(**fireproofing** agent, for graft polymers)

IT **112409-72-0**, Acrylonitrile-butadiene-maleic anhydride-N-phenylmaleimide-styrene-2,4,6-tribromophenyl methacrylate graft copolymer
(**fireproofing** agents for, **phosphines** and **phosphine** oxides as)

L34 ANSWER 27 OF 31 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1988:22827 HCAPLUS
DOCUMENT NUMBER: 108:22827
TITLE: Heat-resistant **flame-retardant** resin compositions
INVENTOR(S): Mori, Kyozo; Kobayashi, Yasuo
PATENT ASSIGNEE(S): Daicel Chemical Industries, Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 62143961	A2	19870627	JP 1985-284454	19851219

PRIORITY APPLN. INFO.: JP 1985-284454 19851219

AB The title compns., having good impact strength, comprise 0.5-10 parts **phosphine** and/or **phosphine** oxide derivative (b. ≥240°) and 100 parts modified ABS polymer prepared from 3-25% rubber and 75-97% acrylonitrile-vinylarene mixture 50-87, halophenyl (meth)acrylate 8-35, and N-phenylmaleimide (I) 5-30%. A mixture of Tufdene 2000A 156.8, styrene 2565, acrylonitrile 231, 2,4,6-tribromophenyl methacrylate 183, I 175, and PhMe 25 parts was polymerized in the presence of lauroyl peroxide at 75° to give 1464 parts copolymer which was mixed with 3% Ph3P and used to prepare injection moldings having fire-resistance rating (UL 94) V-2, heat distortion temperature 98°, and notched Izod impact strength 9.1 kg-cm/cm, vs. HB, 100, and 8.8, resp., without Ph3P.

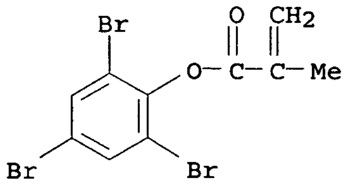
IT **112060-00-1**
(ABS polymer blends, **flame-retardant**)

RN 112060-00-1 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2,4,6-tribromophenyl ester, polymer with ethenylbenzene, 1-phenyl-1H-pyrrole-2,5-dione and 2-propenenitrile (9CI) (CA INDEX NAME)

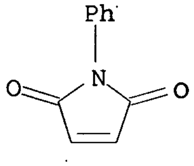
CM 1

CRN 37721-71-4
CMF C10 H7 Br3 O2



CM 2

CRN 941-69-5
CMF C10 H7 N O2



CM 3

CRN 107-13-1
CMF C3 H3 N

$H_2C{=}CH{-}C{\equiv}N$

CM 4

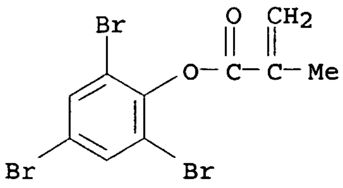
CRN 100-42-5
CMF C8 H8

$H_2C{=}CH{-}Ph$

IT **112059-99-1**
(**phosphine** derivative-containing, **flame-retardant**)
RN 112059-99-1 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, 2,4,6-tribromophenyl ester, polymer with 1,3-butadiene, ethenylbenzene, 1-phenyl-1H-pyrrole-2,5-dione and 2-propenenitrile, graft (9CI) (CA INDEX NAME)

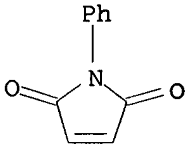
CM 1

CRN 37721-71-4
CMF C10 H7 Br3 O2



CM 2

CRN 941-69-5
CMF C10 H7 N O2



CM 3

CRN 107-13-1
CMF C3 H3 N

$H_2C{=}CH{-}C{\equiv}N$

CM 4

CRN 106-99-0
CMF C4 H6

$H_2C{=}CH{-}CH{=}CH_2$

CM 5

CRN 100-42-5
CMF C8 H8

$H_2C{=}CH{-}Ph$

IC ICM C08L055-02
ICS C08K005-50; C08K005-53
CC 37-6 (Plastics Manufacture and Processing)
ST heat resistance ABS polymer; styrene graft copolymer **fireproofing**; **fireproofing** ABS polymer; bromophenyl methacrylate ABS **fireproofing**; maleimide

phenyl ABS polymer; **phosphine fireproofing** ABS polymer; impact strength ABS polymer; SBR graft copolymer **fireproofing**; acrylonitrile graft polymer **fireproofing**

IT **Fireproofing** agents
(**phosphine** derivs., for ABS polymer blends)

IT 603-35-0, **Triphenylphosphine**, uses and miscellaneous
791-28-6, **Triphenylphosphine** oxide
(ABS graft polymers containing, **flame-retardant**)

IT **112060-00-1**
(ABS polymer blends, **flame-retardant**)

IT 106677-58-1
(blends containing, **flame-retardant**, impact-resistant)

IT **112059-99-1**
(**phosphine** derivative-containing, **flame-retardant**)

L34 ANSWER 28 OF 31 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1983:523168 HCAPLUS
DOCUMENT NUMBER: 99:123168
TITLE: Polyethylene glycol monoacrylate aryl alkali phosphites
INVENTOR(S): Surpateanu, Gheorghe; Sunel, Valeriu; Antohe, Nicolae; Sauciuc, Ariadna; Surpateanu, Mioara; Luchian, Cristina; Gaburici, Maria; Ionescu, Maria; Moisa, Constantin
PATENT ASSIGNEE(S): Intreprinderea de Fibre Sintetice, Savinesti, Rom.
SOURCE: Rom., 3 pp.
CODEN: RUXXA3
DOCUMENT TYPE: Patent
LANGUAGE: Romanian
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

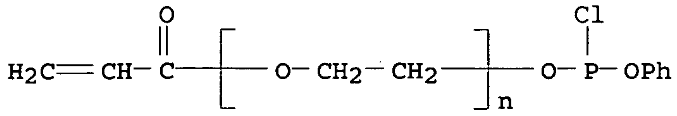
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
RO 78277	B	19820201	RO 1979-98917	19791012
PRIORITY APPLN. INFO.:			RO 1979-98917	19791012

AB MOP(OC6H4R-p)O(CH2CH2O)nOCCH:CH2 (R = H or SO3H, M = Na or K, n = 2-15) useful in the manufacture of acrylic fibers with improved fire resistance, antistatic properties, and dyeability, are manufactured by heating polyethylene glycol monoacrylate Ph phosphorochloridate [**87135-09-9**] with water at 50-60° to eliminate HCl, followed by treatment of the product with concentrated NaOH or KOH.

IT **87135-09-9P**
(manufacture and alkali salt formation of)

RN 87135-09-9 HCAPLUS

CN Poly(oxy-1,2-ethanediyl), α-(1-oxo-2-propenyl)-ω-[(chlorophenoxyphosphino)oxy]- (9CI) (CA INDEX NAME)

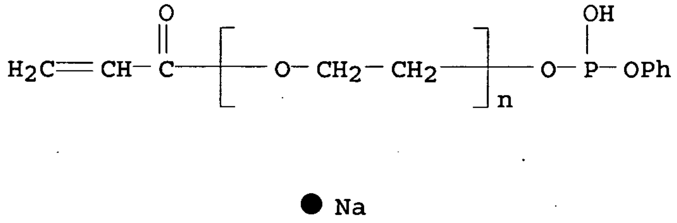


$H_2C{=}CH{-}\overset{\overset{O}{\|}}{C}{-}\left[O{-}CH_2{-}CH_2\right]_n{-}O{-}\overset{\overset{Cl}{|}}{P}{-}OPh$

IT **87135-10-2P**
(manufacture of, for use in manufacture of **fireproof** antistatic dyeable acrylic fibers)

RN 87135-10-2 HCAPLUS

CN Poly(oxy-1,2-ethanediyl), α-(1-oxo-2-propenyl)-ω-[(hydroxyphenoxyphosphino)oxy]-, sodium salt (9CI) (CA INDEX NAME)



$H_2C{=}CH{-}\overset{\overset{O}{\|}}{C}{-}\left[O{-}CH_2{-}CH_2\right]_n{-}O{-}\overset{\overset{OH}{|}}{P}{-}OPh$

● Na

IC C07C069-54

CC 35-8 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 40

ST polyoxyethylene acrylate aryl alkali phosphite; acrylic fiber **fireproofing**; antistatic acrylic fiber; dyeability acrylic fiber

IT Acrylic fibers, preparation
(manufacture of **fireproof** antistatic dyeable)

IT Antistatic agents
Fireproofing agents
(polyethylene glycol monoacrylate aryl alkali phosphites, manufacture of, for acrylic fibers)

IT **87135-09-9P**
(manufacture and alkali salt formation of)

IT **87135-10-2P**
(manufacture of, for use in manufacture of **fireproof** antistatic dyeable acrylic fibers)

L34 ANSWER 29 OF 31 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1975:594316 HCAPLUS
DOCUMENT NUMBER: 83:194316
TITLE: Phosphorus-containing polyesters
INVENTOR(S): Okada, Naotake; Iwabuchi, Takeshi
PATENT ASSIGNEE(S): Nissan Chemical Industries, Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 50071652	A2	19750613	JP 1973-123778	

1973
1102
JP 57051414 B4 19821101
PRIORITY APPLN. INFO.: JP 1973-123778 A
1973
1102

AB Reaction products of arylphosphonous dichloride and unsatd. acids are polycondensed with diphenols to give P-containing polyesters. The polyesters are useful as **fireproofing** agents for polymers. Thus, 21.9 g acrylic acid was added to 54.5g pheylphosphonous dichloride at 80° and the mixture was stirred 4 hr at 100°. A mixture of 0.1g powdered MgCl2 and 25g bis(4-hydroxyphenyl) sulfone was added to 26.0g of the above reaction mixture in 40 ml Cl2CHCHCl2, and the mixture was heated 4.5 hr at 150° to give a white polymer (I) [**57118-60-2**] m. 130-40° and having intrinsic viscosity 0.390 dl/g (30°, 3:2 PhOH-Cl2CHCHCl2). Similarly prepared were acrylic acid-bisphenol A-phenylphosphonous dichloride copolymer [**57118-61-3**], bis(4-hydroxyphenyl) sulfone-methacrylic acid-phenylphosphonous dichloride copolymer [**57118-57-7**], bis(4-hydroxyphenyl) sulfone-crotonic acid-phenylphosphonous dichloride copolymer [**57118-58-8**], and acrylic acid-4,4'-isopropylidenebis(3,5-dibromophenol)-phenylphosphonous dichloride polymer [**57118-59-9**].

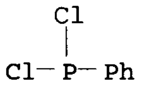
IT **57118-57-7 57118-58-8 57118-59-9**
57118-60-2 57118-61-3
(**fireproofing** agents, for polymers)

RN 57118-57-7 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, polymer with phenylphosphonous dichloride and 4,4'-sulfonylbis[phenol] (9CI) (CA INDEX NAME)

CM 1

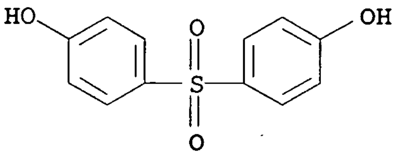
CRN 644-97-3
CMF C6 H5 Cl2 P



Cl_2PPh

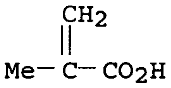
CM 2

CRN 80-09-1
CMF C12 H10 O4 S



CM 3

CRN 79-41-4
CMF C4 H6 O2



$\mathrm{Me{-}\overset{CH_2}{\overset{\|}{C}}{-}CO_2H}$

RN 57118-58-8 HCAPLUS
CN 2-Butenoic acid, polymer with phenylphosphonous dichloride and 4,4'-sulfonylbis[phenol] (9CI) (CA INDEX NAME)

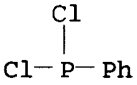
CM 1

CRN 3724-65-0
CMF C4 H6 O2

$\mathrm{Me{-}CH{=}CH{-}CO_2H}$

CM 2

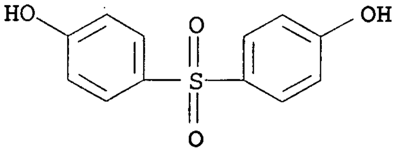
CRN 644-97-3
CMF C6 H5 Cl2 P



$\mathrm{Cl{-}\overset{Cl}{\overset{|}{P}}{-}Ph}$

CM 3

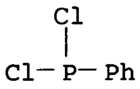
CRN 80-09-1
CMF C12 H10 O4 S



RN 57118-59-9 HCAPLUS
CN 2-Propenoic acid, polymer with 4,4'-(1-methylethylidene)bis[2,6-dibromophenol] and phenylphosphonous dichloride (9CI) (CA INDEX NAME)

CM 1

CRN 644-97-3
CMF C6 H5 Cl2 P



$\mathrm{Cl-\overset{Cl}{\overset{|}{P}}-Ph}$

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     CM   2

     CRN  79-94-7
     CMF  C15 H12 Br4 O2
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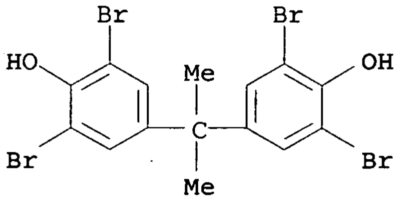

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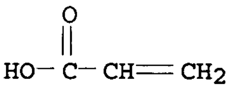
     CM   3

     CRN  79-10-7
     CMF  C3 H4 O2
```

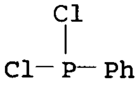


$\mathrm{HO-\overset{O}{\overset{\|}{C}}-CH{=}CH_2}$

```
RN   57118-60-2  HCAPLUS
CN   2-Propenoic acid, polymer with phenylphosphonous dichloride and
     4,4'-sulfonylbis[phenol] (9CI)  (CA INDEX NAME)

     CM   1

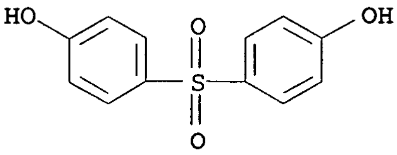
     CRN  644-97-3
     CMF  C6 H5 Cl2 P
```



$\mathrm{Cl-\overset{Cl}{\overset{|}{P}}-Ph}$

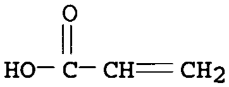
```
     CM   2

     CRN  80-09-1
     CMF  C12 H10 O4 S
```



CM 3

CRN 79-10-7
CMF C3 H4 O2

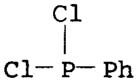


$$HO-\overset{\overset{O}{\|}}{C}-CH=CH_2$$

RN 57118-61-3 HCAPLUS
CN 2-Propenoic acid, polymer with 4,4'-(1-methylethylidene)bis[phenol] and phenylphosphonous dichloride (9CI) (CA INDEX NAME)

CM 1

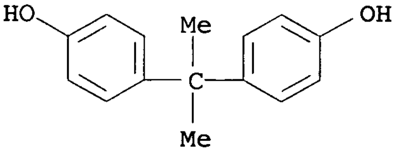
CRN 644-97-3
CMF C6 H5 Cl2 P



$$Cl-\overset{\overset{Cl}{|}}{P}-Ph$$

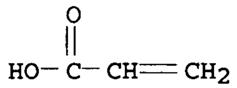
CM 2

CRN 80-05-7
CMF C15 H16 O2



CM 3

CRN 79-10-7
CMF C3 H4 O2



$HO-C(=O)-CH=CH_2$

IC C08G; C08K; D06M
CC 36-3 (Plastics Manufacture and Processing)
ST phenylphosphonous dichloride copolymer; **fireproofing** agent **phosphinate** polyester; acrylic acid copolymer; methacrylic acid copolymer; crotonic acid copolymer; bisphenol polyester **fireproofing** agent
IT **Fireproofing**
   (agents for **phosphinate** group-containing polyesters as, for polymers)
IT Polyesters, preparation
   (**fireproofing** agents, from diphenols and phenylphosphonous dichloride-unsatd. acid adducts)
IT **57118-57-7 57118-58-8 57118-59-9**
   57118-60-2 57118-61-3
   (**fireproofing** agents, for polymers)

L34 ANSWER 30 OF 31 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1974:537073 HCAPLUS
DOCUMENT NUMBER: 81:137073
TITLE: Self-extinguishing, impact-resistant thermoplastic resin blends
INVENTOR(S): Kudo, Teizo; Tokuhara, Shinji; Ohhata, Keiichi
PATENT ASSIGNEE(S): Daicel Ltd.
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
JP 49044059	A2	19740425	JP 1972-88503		1972 0904
JP 56052939	B4	19811215			
PRIORITY APPLN. INFO.:			JP 1972-88503	A	1972 0904

AB The self-extinguishing, impact-resistant resin composition contains 100 parts rubber-modified resin blend of 3-30 weight % rubber units and 70-97 weight % copolymer(s) derived from .geq.40% styrene, 5-35% Ph acrylate or methacrylate with 2-5 Br groups/ring, and other comonomer(s) and 0.5-10 parts **phosphine** and (or) **phosphine** oxide b. >240.deg.. Thus, a composition of 15:45:40 acrylonitrile-styrene-2,4,6-tribromophenyl methacrylate copolymer [**52255-56-8**] 25, ABS resin [9003-56-9] of 21.8:13:65.2 acrylonitrile-SBR-styrene 75, and **triphenylphosphine** [603-35-0] 2.5 parts was pelletized, and injection molded at 210.deg. and 80 kg/cm2 to give test pieces with Izod impact strength with notch 11.7 kg-cm/cm2 heat-distortion temperature 83.deg., and fire resistance (UL 94) SE-II, compared with 10.9 kg cm/cm2

86.deg., and SB, resp., for a similar composition without Ph3P.

IT **52255-56-8**
(blends with ABS resin and triphenyl **phosphine**, fire- and impact-resistant)

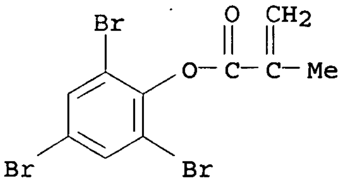
RN 52255-56-8 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 2,4,6-tribromophenyl ester, polymer with ethenylbenzene and 2-propenenitrile (9CI) (CA INDEX NAME)

CM 1

CRN 37721-71-4

CMF C10 H7 Br3 O2



CM 2

CRN 107-13-1

CMF C3 H3 N

$H_2C{=}CH{-}C{\equiv}N$

CM 3

CRN 100-42-5

CMF C8 H8

$H_2C{=}CH{-}Ph$

INCL 25(1)C318.1; 25(1)C142.181

CC 36-6 (Plastics Manufacture and Processing)

ST fire resistance thermoplastic blend; impact strength thermoplastic; ABS resin blend; bromophenyl methacrylate copolymer blend; **phosphine** fire retardant

IT **Fireproofing**
(agents for, tribromophenyl methacrylate and **triphenylphosphine** as, of acrylonitrile copolymers)

IT Plastics
(**fireproofing** of, with tribromophenyl methacrylate and triphenyl **phosphine**)

IT **52255-56-8**
(blends with ABS resin and triphenyl **phosphine**, fire- and impact-resistant)

IT 603-35-0
(**fireproofing** agents, for plastic blends)

IT 13840-40-9

(**fireproofing** agents, for plastics)

L34 ANSWER 31 OF 31 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1974:537022 HCAPLUS
DOCUMENT NUMBER: 81:137022
TITLE: **Flame retardant** and intumescent compositions
INVENTOR(S): Kuehn, Erich
PATENT ASSIGNEE(S): Atlas Chemical Industries, Inc.
SOURCE: U.S., 9 pp. Division of U.S. 3,728,138 (CA 79;19733u).
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 5
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 3801333	A	19740402	US 1972-297397	19721013
US 3639535	A	19720201	US 1968-726538	19680503
US 3728138	A	19730417	US 1971-104149	19710105
US 3864135	A	19750204	US 1973-409895	19731026
PRIORITY APPLN. INFO.:			US 1968-726538 A3	19680503
			US 1971-104149 A3	19710105
			US 1972-297397 A3	19721013

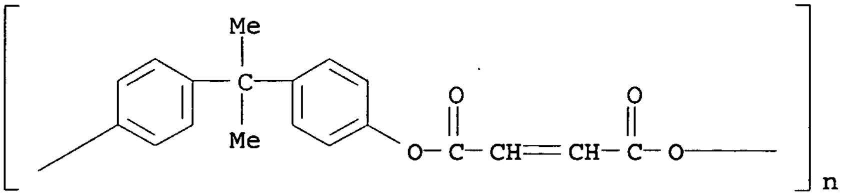
AB Halogenated or P-containing diallyl chlorendate derivs. (I, X = halogen or PO(OR)2 where R = C1-4 alkyl, Ph, or halophenyl) or mineral acid salts of phenylbiguanidine (II, X = halogen, n = 0-5) were useful as **flame retardants** and intumescent additives for polymers, especially polyurethanes. Thus, 41.7 g tolylene diisocyanate-sorbitol-based polyoxypropylene polyol prepolymer was dissolved in cellosolve acetate 10.4, MeCOEt 5.2, and toluene 5.2 g and mixed with 37.5 g bis[2,3-bis(dibutylphosphono)propyl] chlorendate [I, X = PO(OBu)2] [36018-58-3] to give a **flame-retardant** varnish.

IT **27879-05-6**
(**fireproofing** agents for, chlorendates and phenylbiguanidines as)

RN 27879-05-6 HCAPLUS

CN Poly[oxy[(2E)-1,4-dioxo-2-butene-1,4-diyl]oxy-1,4-phenylene(1-

methylethylidene)-1,4-phenylene] (9CI) (CA INDEX NAME)

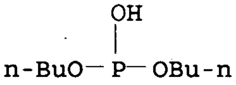


(**fireproofing** and intumescent agents for,
chlorendates and phenylbiguenidines as

IT **2244-27-1**
(reaction of, with bis(dibromopropyl) chlorendate)

RN 2244-27-1 HCAPLUS

CN Phosphorous acid, dibutyl ester, sodium salt (8CI, 9CI) (CA INDEX NAME)



● Na

IC C09D

INCL 106015000FP

CC 36-6 (Plastics Manufacture and Processing)

ST polyurethane **flame retardant** coating;
fireproofing polyurethane halogenated chlorendate;
intumescent additive polyurethane; phosphono chlorendate
intumescent polyurethane; phenylbiguanide deriv
fireproofing polyurethane; biguanidine deriv
fireproofing polyurethane

IT Polyesters, uses and miscellaneous
Urethane polymers, uses and miscellaneous
(**fireproofing** agents for, chlorendates and
phenylbiguanidines as)

IT Polyesters, uses and miscellaneous
Urethane polymers, uses and miscellaneous
(**fireproofing** and intumescent agents for,
chlorendates and phenylbiguenidines as)

IT **Fireproofing**
(of urethane polymers, chlorendates and phenylbiguanidines for)

IT **Fireproofing**
(urethane polymers, chlorinidines and phenylbiguanidines)

IT 9003-20-7 **27879-05-6**
(**fireproofing** agents for, chlorendates and
phenylbiguanidines as)

IT 36018-58-3 42498-64-6
(**fireproofing** agents, for urethane polymers)

IT 9003-20-7 **27879-05-6**
(**fireproofing** and intumescent agents for,
chlorendates and phenylbiguenidines as)

IT **2244-27-1**

(reaction of, with bis(dibromopropyl) chlorendate)